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THE STUDENT LIFE. A FAREWELL ADDRESS TO CANADIAN AND AMERICAN MEDICAL STUDENTS.

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EXCEPT it be a lover, no one is more interesting as an object of study than a student. Shakespeare might have made him a fourth in his immortal group. The lunatic with his fixed idea, the poet with his fine frenzy, the lover with his frantic idolatry, and the student aflame with the desire for knowledge are of "imagination all compact." To an absorbing passion, a whole-souled devotion, must be joined an enduring energy, if the student is to become a devotee of the gray-eyed goddess to whose law his services are bound. Like the quest of the Holy Grail, the quest of Minerva is not for all. For the one, the pure life, for the other, what Milton calls "a strong propensity of nature." Here again the student often resembles the poet,—he is born, not made. While the resultant of two molding forces, the accidental, external conditions, and the hidden, germinal energies, which produce in each one of us national, family and individual traits, the true student possesses in some measure a divine spark which sets at naught their laws. Like the Snark, he defies definition, but there are three unmistakable signs by which you may recognize the genuine article from a Boojum—an absorbing desire to know the truth, an unswerving steadfastness in its pursuit, and an open, honest heart, free from suspicion, guile and jealousy.

At the outset do not be worried about this big question—Truth. It is a very simple matter if each one of you starts with the desire to get as much as possible. No human being is constituted to know the truth, the whole truth and nothing but the truth; and even the best of men must be content with fragments, with partial glimpses, never the full fruition. In this unsatisfied quest the attitude of mind, the desire, the thirst (a thirst that from the soul must rise!), the fervent longing, are the be-all and the end-all. What is the student but a lover courting a fickle mistress who ever eludes his grasp? In this very elusiveness is brought out his second great characteristic—steadfastness of purpose. Unless from the start the limitations incident to our frail human faculties are frankly accepted, nothing but disappointment awaits you. The Truth is the best you can get with your best

endeavor, the best that the best men accept—with this you must learn to be satisfied, retaining at the same time a due humility and an earnest desire for an ever larger portion. Only by keeping the mind plastic and receptive does the student escape perdition. It is not, as Charles Lamb remarks, that some people do not know what to do with truth when it is offered to them, but the tragic faith is to reach, after years of patient search, a condition of mind-blindness, in which the truth is not recognized, though it stares you in the face. This can never happen to a man who has followed step by step the growth of a truth, and who knows the painful phases of its evolution. It is one of the great tragedies of life that every truth has to struggle to acceptance against honest but mind-blind students. Harvey knew his contemporaries well and for twelve successive years demonstrated the circulation of the blood before daring to publish the facts, on which the truth was based.¹ Only steadfastness of purpose and humility enable the student to shift his position to meet the new conditions in which new truths are born, or old ones modified beyond recognition. And, thirdly, the honest heart will keep him in touch with his fellow-students, and furnish that sense of comradeship without which he travels an arid waste alone. I say advisedly an honest heart—the honest head is prone to be cold and stern, given to judgment, not mercy, and not always able to entertain that true charity which, while it thinketh no evil, is anxious to put the best possible interpretation upon the motives of a fellow worker. It will foster, too, an attitude of generous, friendly rivalry untinted by the yellow peril, jealousy, that is the best preventive of the growth of a bastard scientific spirit-loving seclusion and working in a lock-and-key laboratory, as timorous of light as is a thief.

You have all become brothers in a great society, not apprentices, since that implies a master, and nothing should be further from the attitude of the teacher than much that is meant in that word, used though it be in another sense, particularly by our French brethren in a most delightful way, signifying a bond of intellectual filiation. A fraternal attitude is not easy to cultivate—the chasm between the chair and the bench is difficult to bridge. Two things have helped to put up a cantilever across the gulf. The successful teacher is no longer on a height, pumping knowledge at high pressure into passive receptacles. The new methods have changed all this. He is no longer *Sir Oracle*, perhaps un-

¹ Delivered before the medical students of McGill College, Montreal, and the students of the Medical Department of the University of Pennsylvania, Philadelphia.

¹ "These views, as usual, pleased some more, others less; some chid and calumniated me and laid it to me as a crime that I had dared to depart from the precepts and opinions of all Anatomists." Chapt. I, *De Motu Cordis*.

consciously by his very manner antagonizing minds to whose level he cannot possibly descend, but he is a senior student anxious to help his juniors. When a simple, earnest spirit animates a college there is no appreciable interval between the teacher and the taught—both are in the same class, the one a little more advanced than the other. So animated, the student feels that he has joined a family whose honor is his honor, whose welfare is his own, and whose interests should be his first consideration.

The hardest conviction to get into the mind of a beginner is that the education upon which he is engaged is not a college course, not a medical course, but a life course, for which the work of a few years under teachers is but a preparation. Whether you will falter and fail in the race, or whether you will be faithful to the end depends on the training before the start, and on your staying powers, points upon which I need not enlarge. You can all become good students, a few may become great students, and now and again one of you will be found who does easily and well what others cannot do at all, or very badly, which is John Farriar's excellent definition of a genius.

In the hurry and bustle of a business world, which is the life of this continent, it is not easy to train first-class students. Under present conditions it is hard to get the needful seclusion, on which account it is that our educational market is so full of wayside fruit. I have always been much impressed by the advice of St. Chrysostom: "Depart from the highway and transplant thyself in some enclosed ground, for it is hard for a tree which stands by the wayside to keep her fruit till it be ripe." The dilettante is abroad in the land, the man who is always venturing on tasks for which he is imperfectly equipped, a habit of mind fostered by the multiplicity of subjects in the curriculum; and while many things are studied, few are studied thoroughly. Men will not take time to get to the heart of a matter. After all, concentration is the price the modern student pays for success. Thoroughness is the most difficult habit to acquire, but it is the pearl of great price, worth all the worry and trouble of the search. The dilettante lives an easy, butterfly life, knowing nothing of the toil and labor with which the treasures of knowledge are dug out of the past, or wrung by patient research in the laboratories. Take, for example, the early history of this country—how easy for the student of the one type to get a smattering, even a fairly full acquaintance with the events of the French and Spanish settlements. Put an original document before him, and it might as well be Arabic. What we need is the other type, the man who knows the records, who, with a broad outlook and drilled in what may be called the embryology of history, has yet a powerful vision for the minutiae of life. It is these kitchen and back-stair men who are to be encouraged, the men who know the subject in

hand in all possible relationships. Concentration has its drawbacks. It is possible to become so absorbed in the problem of the "enclitic de," or the structure of the flagella of the *Trichomonas*, or of the toes of the prehistoric horse, that the student loses the sense of proportion in his work, and even wastes a lifetime in researches which are valueless because not in touch with current knowledge. You remember poor Cassaubon, in Middlemarch, whose painful scholarship was lost on this account. The best preventive to this is to get denationalized early. The true student is a citizen of the world, the allegiance of whose soul, at any rate, is too precious to be restricted to a single country. The great minds, the great works transcend all limitations of time, of language and of race, and the scholar can never feel initiated into the company of the elect until he can approach all of life's problems from the cosmopolitan standpoint. I care not in what subject he may work, the full knowledge cannot be reached without drawing on supplies from lands other than his own—French, English, German, American, Japanese, Russian, Italian—there must be no discrimination by the loyal student, who should willingly draw from any and every source with an open mind and a stern resolve to render unto all their dues. I care not on what stream of knowledge he may embark, follow up its course, and the rivulets that feed it flow from many lands. If the work is to be effective he must keep in touch with scholars in other countries. How often has it happened that years of precious time have been given to a problem already solved or shown to be insoluble, because of the ignorance of what had been done elsewhere. And it is not only book knowledge and journal knowledge, but man knowledge that is needed. The student will, if possible, see the men in other lands. Travel not only widens the vision and gives certainties in place of vague surmises, but the personal contact with foreign workers enables him to appreciate better the failings or successes in his own line of work, perhaps to look with more charitable eyes on the work of some brother whose limitations and opportunities have been more restricted than his own. Or, in contact with a master-mind, he may take fire, and the glow of the enthusiasm may be the inspiration of his life. Concentration must then be associated with large views on the relation of the problem, and a knowledge of its status elsewhere; otherwise it may land him in the slough of a specialism so narrow that it has depth and no breadth, or he may be led to make what he believes to be important discoveries, but which have been long current coin in other lands. It is sad to think that the day of the great polymathic student is at an end; that we may, perhaps, never again see a Soaliger, a Haller, or a Humboldt—men who took the whole field of knowledge for their domain and viewed it as from a pinnacle. And yet a great specializing generalist may arise, who can tell? Some two-

th-century Aristotle may be now tugging at his bottle, as little dreaming, as are his parents or his friends, of a conquest of the mind, beside which the wonderful victories of the Stagirite will look pale. The value of a really great student to the country is equal to half a dozen grain elevators or a new trans-continental railway. He is a commodity singularly fickle and variable, and not to be grown to order. So far as his advent is concerned there is no telling when or where he may arise. The conditions seem to be present even under the most unlikely externals. Some of the "greatest students this country has produced have come from small villages and country places. It is impossible to predict from a study of the environment, which a "strong propensity of nature," to quote Milton's phrase again, will easily bend or break.

The student must be allowed full freedom in his work, undisturbed by the utilitarian spirit of the Philistine, who cries *cui bono* and distrusts pure science. The present remarkable position in applied, and industrial trades of all sorts have been made possible by men who did pioneer work in chemistry, in physics, in biology, and in physiology, without a thought of any practical application in their researches. The members of this higher group of productive students are rarely understood by the common spirits, who appreciate as little their unselfish devotion as their unworldly neglect of the practical side of the problems.

Everywhere now the medical student is welcomed as an honored member of the guild. There was a time, I confess, and it is within the memory of some of us, when, like Falstaff, he was given to "taverns and sack and wine and metheglins, and to drinkings and swearings and starings, pribles and prabbles"; but all that has changed with the curriculum, and the "Meds" now roar you as gently as the "Theologs."

What I have said upon the general life and mental attitude of the student applies with tenfold force to you on account of the peculiar character of the subject-matter of your studies. Man, with all his mental and bodily anomalies and diseases—the machine in order, the machine in disorder, and the business yours to put it to rights. Through all the phases of its career this most complicated mechanism of this wonderful world will be the subject of your study and of your care—the naked, new-born infant, the artless child, the lad and the lassie just aware of the tree of knowledge overhead, the strong man in the pride of life, the woman with the benediction of maternity on her brow, and the aged, peaceful in the contemplation of the past. Almost everything has been renewed in the science and in the art of medicine, but all through the long centuries there has been no variableness or shadow of change in the essential features of the life which is our contemplation and our care. The sick love-child of Israel's sweet singer, the plague-stricken hopes of the great Athenian

statesman, Elpenor, bereft of his beloved Artemidora, and Tully's daughter mourned so tenderly, are not of any age or any race—they are here with us to-day, with the Hamlets, the Ophelias, and the Lears. Amid an eternal heritage of sorrow and suffering our work is laid, and this eternal note of sadness would be insupportable if the daily tragedies were not relieved by the spectacle of the heroism and devotion displayed by the actors. Nothing will sustain you more potently than the power to recognize in your humdrum routine, as perhaps it may be thought, the true poetry of life—the poetry of the commonplace, of the ordinary man, of the plain, toil-worn woman, with their loves and their joys, their sorrows and their griefs. The comedy, too, of life will be spread before you, and nobody laughs more often than the doctor at the pranks Puck plays upon the Titianias and the Bottoms among his patients. The humorous side is really almost as frequently turned toward him as the tragic. Lift up one hand to heaven and thank your stars if they have given you the proper sense to enable you to appreciate the inconceivably droll situations in which we catch our fellow creatures. Unhappily, this is one of the free gifts of the gods, unevenly distributed, not bestowed on all, or on all in equal portions. In undue measure it is not without risk, and in any case in the doctor it is better appreciated by the eye than expressed on the tongue. Hilarity and good humor, a breezy cheerfulness, a nature sloping toward the southern side, as Lowell has it, help enormously both in the study and in the practice of medicine. To many of a sombre and sour disposition it is hard to maintain good spirits amid the trials and tribulations of the day, and yet it is an unpardonable mistake to go about among patients with a long face.

Divide your attentions equally between books and men. The strength of the student of books is to sit still—two or three hours at a stretch—eating the heart out of a subject with pencil and note-book in hand, determined to master the details and intricacies, focusing all your energies on its difficulties. Get accustomed to test all sorts of book problems and statements for yourself, and take as little as possible on trust. The Hunterian "Do not think, but try" attitude of mind is the important one to cultivate. The question came up one day, when discussing the grooves left on the nails after fever, how long it took for the nail to grow out, from root to edge. A majority of the class had no further interest; a few looked it up in books; two men marked their nails at the root with nitrate of silver, and a few months later had positive knowledge on the subject. They showed the proper spirit. The little points that come up in your reading try to test for yourselves. With one fundamental difficulty many of you will have to contend from the outset—a lack of proper preparation for really hard study. No one can have watched successive groups of young men pass through

the special schools without a profound sympathy for the hap-hazard, fragmentary character of their preliminary education. It does seem too bad that we cannot have a student in his eighteenth year sufficiently grounded in the humanities and in the sciences preliminary to medicine—but this is an educational problem upon which only a Milton or a Locke could discourse with profit. With pertinacity you can overcome the preliminary defects, and once thoroughly interested, the work in books becomes a pastime.

A serious drawback in the student life is the self-consciousness, bred of too close devotion to books. A man gets shy, "dysopic," as old Timothy Bright calls it, and shuns the looks of men, and blushes like a girl. The strength of a student of men is to travel—to study men, their habits, character, mode of life, their behavior under varied conditions, their vices, virtues and peculiarities. Begin with a careful observation of your fellow-students and of your teachers; then, every patient you see is a lesson in much more than the malady with which he suffers. Mix as much as you possibly can with the outside world, and learn its ways. The student societies, the students' union, the gymnasium, and the outside social circle should be cultivated systematically, to enable you to conquer the diffidence which goes with bookishness and which will prove a very serious drawback in after-life. I cannot too earnestly impress upon the earnest and attentive men among you the necessity of overcoming this unfortunate failing in your student days. It is not easy for every one to reach a happy medium, and the distinction between a proper self-confidence and "cheek," particularly in junior students, is not always to be made. The latter is met with chiefly among the student pilgrims who, in traveling down the Delectable mountains, have gone astray and have passed to the left hand, where lieth the country of Conceit, the country in which you remember the brisk lad Ignorance met Christian. I wish we could encourage on this continent the habit of wandering among our best students. I do not know that we are quite prepared for it, as there is still great diversity in the curricula, even among the leading schools, but it is undoubtedly a great advantage to study under different teachers, as the mental horizon is widened and the sympathies enlarged. The practice would do much to lessen that narrow "I am of Paul and I am of Apollos" spirit which is hostile to the best interests of the profession.

There is much that I would like to say on the question of work, but I can only spare a few moments for a word or two. Who will venture to settle upon so simple a matter as the best time for work? One will tell us there is no best time; all are equally good; and truly, all times are the same to a man whose soul is absorbed in some great problem. The other day I asked Edward Martin, the well-known story writer, what time he found best for work. "Not in

the evening, and never between meals!" was his answer, which may appeal to some of my hearers. One works best at night; another, in the morning; a majority of the students of the past favor the latter. Erasmus, the great exemplar, says, "Never work at night; it dulls the brain and hurts the health." One day, going with George Ross through Bedlam, Dr. Savage, at that time the physician in charge, remarked upon two great groups of patients—those who were depressed in the morning and those who were cheerful, and he suggested that the spirits rose and fell with the bodily temperature—those with very low morning temperaments were depressed, and vice versa. This, I believe, expresses a truth which may explain the extraordinary difference in the habits of students in this matter of the time at which the best work can be done. Outside of the asylum there are also the two great types, the student-lark who loves to see the sun rise, who comes to breakfast with a cheerful morning face, never so "fit" as at 6 A. M. We all know the type. What a contrast to the student-owl with his saturnine morning face, thoroughly unhappy, cheated by the wretched breakfast bell of the two best hours of the day for sleep, no appetite, and permeated with an unspeakable hostility to his *vis-à-vis*, whose morning garrulity and good humor are equally offensive. Only gradually, as the day wears on and his temperature rises, does he become endurable to himself and to others. But see him really awake at 10 P. M. While the plethoric lark is in hopeless coma over his books, from which it is hard to rouse him sufficiently to get his boots off for bed, our lean owl-friend, Saturn no longer in the ascendant, with bright eyes and cheery face, is ready for four hours of anything you wish—deep study, or

"Heart affluence in discursive talk,"

and by 2 A. M. he will undertake to unsphere the Spirit of Plato. In neither a virtue, in neither a fault; we must recognize these two types of students, differently constituted and owing possibly—though I have but little evidence for the belief—to thermal peculiarities.

In the days of probation the student life may be lived by each one of you in its fulness and in its joys, but the difficulties arise in the break which follows departure from college and the entrance upon new duties. Much will now depend on the attitude of mind which has been encouraged. If the work has been for your degree, if the diploma has been its sole aim and object, you will rejoice in a freedom from exacting and possibly unpleasant studies, and with your books you will throw away all thoughts of further systematic work. On the other hand, with good habits of observation you may have got deep enough into the subject to feel that there is still much to be learned, and if you have had ground into you the lesson that the collegiate period is only the beginning of the student life, there is a hope that you may enter

upon the useful career of the *student-practitioner*. Five years, at least, of trial await the man after parting from his teachers, and entering upon an independent course, years upon which his future depends and from which his horoscope may be cast with certainty. It is all the same whether he settles in a country village, or goes on with hospital and laboratory work; whether he takes a prolonged trip abroad, or whether he settles down in practice, with a father or a friend,—these five waiting years fix his fate so far as the student life is concerned. Without any strong natural propensity to study, he may feel such a relief after graduation that the effort to take to books is beyond his mental strength, and a weekly journal with an occasional text-book furnish pabulum enough, at least, to keep his mind hibernating. But ten years later he is dead mentally, past any possible hope of galvanizing into life as a student, fit to do a routine practice, often a capable, resourceful man, but without any deep convictions, and probably more interested in stocks or in horses than in diagnosis or therapeutics. But this is not always the fate of the student who finishes his work on Commencement day. There are men full of zeal in practice, and who give good service to their fellow creatures, who have not the capacity or the energy to keep up with the times. While they have lost interest in science, they are loyal members of the profession, and appreciate their responsibilities as such. That fateful first lustrum ruins some of our most likely material. Nothing is more trying to the soldier than inaction, to mark time while the battle is raging all about him; and waiting for practice is a serious strain under which many yield. In the cities it is not so hard to keep up; there is work in the dispensaries and colleges, and the stimulus of the medical societies; but in smaller towns and in the country it takes a strong man to live through the years of waiting without some deterioration. I wish the custom of taking junior men as partners and assistants would grow on this continent. It has become a necessity, and no man in large general practice can do his work efficiently without skilled help. How incalculably better for the seniors; how beneficial to the patients; how helpful in every way if each one of you, for the first five or ten years, was associated with a senior practitioner, doing his night work, his laboratory work, his chores of all sorts. You would, in this way, escape the chilling and killing isolation of the early years, and amid congenial surroundings you could, in time, develop into that flower of our calling—the cultivated general practitioner. May this be the destiny of a large majority of you! Have no higher ambition! You cannot reach any better position in a community; the family doctor is the man behind the gun, who does our effective work. That his life is hard and exacting; that he is underpaid and overworked; that he has but little time for study and less for recreation

—these are the blows that may give finer temper to his steel, and bring out the nobler elements in his character. What lot or portion has the general practitioner in the student life? Not, perhaps, the fruitful heritage of Judah or Benjamin, but he may make of it the goodly portion of Ephraim. A man with powers of observation, well trained in the wards, and with the strong natural propensity to which I have so often referred, may live the ideal student life, and even reach the higher levels of scholarship. Adams, of Banchory (a little Aberdeenshire village), was not only a good practitioner and a skilful operator, but he was an excellent naturalist. This is by no means an unusual or remarkable combination, but Adams became, in addition, one of the great scholars of the profession. He had a perfect passion for the classics, and amid a very exacting practice found time to read "almost every Greek work which has come down to us from antiquity, except the ecclesiastical writers." He translated the works of Paulus Æginata, the works of Hippocrates, and the works of Aretæus, all of which are in the Sydenham Society's publications, monuments of the patient skill and erudition of a Scottish village doctor, an incentive to every one of us to make better use of our precious time.

Given the sacred hunger and proper preliminary training, the student-practitioner requires at least three things with which to stimulate and maintain his education, a note-book, a library and a quinquennial brain dusting. I wish I had time to speak of the value of note-taking. You can do nothing as a student in practice without it. Carry a small note-book which will fit into your waistcoat pocket, and never ask a new patient a question without note-book and pencil in hand. After the examination of a pneumonia case two minutes will suffice to record the essentials in the daily progress. Routine and system, when once made a habit, facilitate work, and the busier you are the more time you will have to make observations after examining a patient. Jot a comment at the end of the notes; "clear case," "case illustrating obscurity of symptoms," "error in diagnosis," etc. The making of observations may become the exercise of a jackdaw-like trick, like the craze which so many of us have to collect articles of all sorts. The study of the cases, the relation they bear to each other and to the cases in literature—here comes in the difficulty. Begin early to make a threefold category—clear cases, doubtful cases, mistakes. And learn to play the game fair, no self-deception, no shrinking from the truth; mercy and consideration for the other man, but none for yourself, upon whom you have to keep an incessant watch. You remember Lincoln's famous *mot* about the impossibility of fooling all of the people all of the time. It does not hold good for the individual who can fool himself to his heart's content all of the time. If necessary, be cruel; use the knife and the cautery

to cure the intumescence and moral necrosis which you will feel in the posterior parietal region, in Gall and Spurzheim's center of self-esteem, and where you will find a sore spot after you have made a mistake in diagnosis. It is only by getting your cases grouped in this way that you can make any real progress in your post-collegiate education; only in this way can you gain wisdom with experience. It is a common error to think that the more a doctor sees the greater his experience and the more he knows. No one ever drew a more skilful distinction than Cowper in his oft-quoted lines, which I am never tired of repeating in a medical audience:

"Knowledge and wisdom, far from being one,
Have ofttimes no connection. Knowledge dwells
In heads replete with thoughts of other men;
Wisdom in minds attentive to their own.
Knowledge is proud that he has learned so much;
Wisdom is humble that he knows no more."

What we call sense or wisdom is knowledge, ready for use, made effective, and bears the same relation to knowledge itself that bread does to wheat. The full knowledge of the parts of a steam engine and the theory of its action may be possessed by a man who could not be trusted to pull the string to its throttle. It is only by collecting data and using them that you can get sense. One of the most delightful sayings of antiquity is the remark of Heraclitus upon his predecessors—that they had much knowledge, but no sense, which indicates that the noble old Ephesian had a keen appreciation of their difference; and the distinction, too, is well drawn by Tennyson in the oft-quoted line:

"Knowledge comes, but Wisdom lingers."

Of the three well-stocked rooms which it should be the ambition of every young doctor to have in his house, the library, the laboratory and the nursery—books, balances and bairns—as he may not achieve all three, I would urge him to start at any rate with the books and the balances. A good weekly and a good monthly journal to begin with, and read them. Then, for a systematic course of study, supplement your college textbooks with the larger systems—Allbutt or Nothnagel—a system of surgery, and, as your practice increases, make a habit of buying a few special monographs every year. Read with two objects; first, to acquaint yourself with the current knowledge on a subject and the steps by which it has been reached, and secondly, and more important, read to understand and analyse your cases. To this line of work we should direct the attention of the student before he leaves the medical school, pointing in specific cases just where the best articles are to be found, sending him to the index catalogue—that marvelous storehouse, every page of which is interesting and the very titles instructive. Early learn to appreciate the differences between the descriptions of disease and the manifestations of that disease in an in-

dividual—the difference between the composite portrait and one of the component pictures. By exercise of a little judgment you can collect at moderate cost a good working library. Try, in the waiting years, to get a clear idea of the history of medicine. Read Foster's *Lectures on the History of Physiology*, Baas's *History of Medicine*. Get the *Masters of Medicine* series, and subscribe to the *Library and Historical Journal*.¹

Every day do some reading or work apart from your profession. I fully realize, no one more so, how absorbing is the profession of medicine; how applicable to it is what Michel Angelo says, "There are sciences which demand the whole of a man, without leaving the least portion of his spirit free for other distractions"; but you will be a better man and not a worse practitioner for an avocation. I care not what it may be, gardening or farming, literature or history or bibliography, any one of which will bring you in contact with books. (I wish that time permitted me to speak of the other two rooms which are really of equal importance with the library, but which are more difficult to equip, though of coordinate value in the education of his head, his heart and his hand.) The third essential for the practitioner as a student is the quinquennial brain dusting, and this will often seem to him the hardest task to carry out. Every fifth year, back to the hospital, back to the laboratory, for renovation, rehabilitation, rejuvenation, reintegration, resuscitation, etc. Do not forget to take the notebooks with you, or the sheets, in three separate bundles, to work over. From the very start begin to save for the trip. Deny yourself all luxuries for it; shut up the room you meant for the nursery,—have the definite determination to get your education thoroughly well started; if you are successful you may, perhaps, have enough saved at the end of three years to spend six weeks in special study; or in five years you may be able to spend six months. Harken not to the voice of old "Dr. Hayseed" who tells you it will ruin your prospects, and that he "never heard of such a thing" as a young man, not yet five years in practice, taking three months' holiday. To him it seems preposterous. Watch him wince when you say it is a speculation in the only gold mine in which the physician should invest—*Grey Cortex*! What about the wife and babies if you have them—leave them! Heavy as are your responsibilities to those nearest and dearest, they are outweighed by the responsibilities to yourself, to the profession and to the public. Like Isaphaena, the story of whose husband—ardent, earnest soul, peace to his ashes!—I have told in the little sketch of "An Alabama Student," your wife will be glad to bear her share in the sacrifice you make. With good health and good habits the end of the second lustrum should find you thoroughly established—all three rooms well furnished, a good stable, a good garden, no mining stock, but a life insurance and, perhaps, a mort-

¹ Brooklyn. Price, \$2 per annum.

gage or two on neighboring farms. Year by year you have dealt honestly with yourself; you have put faithfully the notes of each case into its proper place, and you will be gratified to find that, though the doubtful cases and mistakes still make a rather formidable pile, it has grown relatively smaller. You literally "own" the country-side, as the expression is. All the serious and dubious cases come to you, and you have been so honest in the frank acknowledgment of your own mistakes, and so charitable in the contemplation of theirs, that neighboring doctors, old and young, are glad to seek your advice. The work which has been very heavy is now lightened by a good assistant, one of your own students, who becomes in a year or so your partner. This is not an overdrawn picture, and it is one which may be seen in many places, except, I am sorry to say, in the particular as to the partners. This is the type of man we need in the country districts and the smaller towns. He is not a whit too good to look after the sick, not a whit too highly educated—impossible! And with an optimistic temperament and a good digestion he is the very best product of our profession, and may do more to stop quackery and humbuggery, inside and outside of the ranks, than could a dozen prosecuting county attorneys. Nay, more! such a doctor may be a daily benediction in the community—a strong, sensible, whole-souled man, living a life often of great self-denial, always of tender sympathy, worried neither by the vagaries of the well nor the testy waywardness of the sick, and to him, if to any, may come (even when he knows it not) the true spiritual blessing—that "blessing which maketh rich and addeth no sorrow."

The danger in such a man's life comes with prosperity. He is safe in the hard-working day, when he is climbing the hill, but once success is reached, with it come the temptations to which many succumb. Politics has been the ruin of many country doctors, and often of the very best, of just such a good fellow of whom I have been speaking. He is popular; he has a little money; and he, if anybody, can save the seat for the party! When the committee leaves you, take the offer under consideration, and if in the ten or twelve years you have kept on intimate terms with those friends of your student days, Montaigne and Plutarch, you will know what answer to return. If you live in a large town, resist the temptation to open a sanatorium. It is not the work for a general practitioner, and there are risks that you may sacrifice your independence and much else besides. And, thirdly, resist the temptation to move into a larger place. In a good agricultural district, or in a small town, if you handle your resources aright, taking good care of your education, of your habits and of your money, and devoting part of your energies to the support of the societies, etc., you may reach a position in the community, of which any man may be proud. There are country practitioners among my friends with whom I would rather

change places than with any in our ranks, men whose stability of character and devotion to duty make one proud of the profession.

Curiously enough, the student practitioner may find studiousness to be a stumbling-block in his career. A bookish man may never succeed; deep-versed in books, he may not be able to use his knowledge to practical effect; or, more likely, his failure is not because he has studied books much, but because he has not studied men more. He has never got over that shyness, that diffidence against which I have warned you. I have known instances in which this malady was incurable; in others I have known a cure effected not by the public, but by the man's professional brethren, who, appreciating his work, have insisted upon utilizing his mental treasures. It is very hard to carry student habits into a large city practice; only zeal, a fiery passion, keeps the flame alive, smothered as it is so apt to be by the dust and ashes of the daily routine. A man may be a good student who reads only the book of nature. Such an one¹ I remember in the early days of my residence in Montreal—a man whose devotion to patients and whose kindness and skill quickly brought him an enormous practice. Reading in his carriage and by lamplight at Lucina's bedside, he was able to keep well informed; but he had an insatiable desire to know the true inwardness of a disease, and it was in this way I came into contact with him. Hard pushed day and night, yet he was never too busy to spend a couple of hours with me searching for data which had not been forthcoming during life, or helping to unravel the mysteries of a new disease, such as pernicious anemia.

The *student specialist* has to walk warily, as with two advantages there are two great dangers against which he has constantly to be on guard. In the bewildering complexity of modern medicine it is a relief to limit the work of a life to a comparatively narrow field which can be thoroughly tilled. To many men there is a feeling of great satisfaction in the mastery of a small department, particularly one in which technical skill is required. How much we have benefited from this concentration of effort in dermatology, laryngology, ophthalmology, and in gynecology! Then, as a rule, the specialist is a freeman, with leisure or, at any rate, with some leisure; not the slave of the public, with the incessant demands upon him of the general practitioner. He may live a more rational life, and has time to cultivate his mind, and he is able to devote himself to public interests and to the welfare of his professional brethren, on whose suffrages he so largely depends. How much we are indebted in the larger cities to the disinterested labors of this favored class, the records of our libraries and medical societies bear witness. The dangers do not come to the strong man in a specialty, but to the weak brother who seeks in it an easier field in which specious garrulity and mechanical

¹ The late John Bell.

dexterity may take the place of solid knowledge. All goes well when the man is larger than his specialty and controls it, but when the specialty runs away with the man there is disaster, and a topsy-turvy condition which, in every branch, has done incalculable injury. Next to the danger from small men is the serious risk of the loss of perspective in prolonged and concentrated effort in a narrow field. Against this there is but one safeguard—the cultivation of the sciences upon which the specialty is based. The student specialist may have a wide vision—no student wider—if he gets away from the mechanical side of the art, and keeps in touch with the physiology and pathology upon which his art depends. More than any other of us, he needs the lessons of the laboratory, and wide contact with men in other departments may serve to correct the inevitable tendency to a narrow and perverted vision, in which the life of the ant-hill is mistaken for the world at large.

Of the *student-teacher* every faculty affords examples in varying degrees. It goes without saying that no man can teach successfully, who is not at the same time a student. Routine, killing routine, saps the vitality of many who start with high aims, and who, for years, strive with all their energies against the degeneration which it is so prone to entail. In the smaller schools isolation, the absence of congenial spirits working at the same subject, favors stagnation, and after a few years the fires of early enthusiasm no longer glow in the perfunctory lectures. In many teachers the ever-increasing demands of practice leave less and less time for study, and a first-class man may lose touch with his subject through no fault of his own, but through an entanglement in outside affairs which he cannot control, yet deeply regrets. To his five natural senses the student teacher must add two more—the sense of responsibility and the sense of proportion. Most of us start with a highly developed sense of the importance of the work and with a desire to live up to the responsibilities intrusted to us. Punctuality, the class first, always and at all times, the best that a man has in him, nothing less; the best the profession has on the subject, nothing less; fresh energies and enthusiasm in dealing with dry details; animated, unselfish devotion to all alike; tender consideration for his assistants—these are some of the fruits of a keen sense of responsibility in a good teacher. The sense of proportion is not so easy to acquire, and much depends on the training and on the natural disposition. There are men who never possess it; to others it seems to come naturally. In the most careful ones it needs constant cultivation—*nothing over much* should be the motto of every teacher. In my early days I became under the influence of an ideal student teacher, the late Palmer Howard, of Montreal. If you ask what manner of man he was, read Matthew Arnold's noble tribute to his father in his well-known poem, *Rugby Chapel*. When young, Dr. How-

ard had chosen a path—"path to a clear-purposed goal," and he pursued it with unswerving devotion. With him the study and the teaching of medicine were an absorbing passion, the ardor of which neither the incessant and ever-increasing demands upon his time nor the growing years could quench. When I first, as a senior student, came into intimate contact with him in the summer of 1871, the problem of tuberculosis was under discussion, stirred up by the epoch-making work of Villemin and the radical views of Niemeyer. Every lung lesion at the Montreal General Hospital had to be shown to him, and I got my first-hand introduction to Laennec, to Graves and to Stokes, and became familiar with their works. No matter what the hour, and it usually was after 10 P.M., I was welcome with my bag, and if Wilks and Moxon, Virchow, or Rokitsanski, gave us no help, there were the Transactions of the Pathological Society and the big *Dictionnaire* of Dechambre. An ideal teacher because a student, ever alert to the new problems, an indomitable energy enabled him in the midst of an exacting practice to maintain an ardent enthusiasm, still to keep bright the fires which he had lighted in his youth. Since those days I have seen many teachers and I have had many colleagues, but I have never known one in whom were more happily combined a stern sense of duty with the mental freshness of youth.

But as I speak from out the memory of the past, there rises before me a shadowy group, a long line of students whom I have taught and loved, and who have died prematurely—mentally, morally, or bodily. To the successful we are all willing and anxious to bring the tribute of praise, but none so poor to give recognition to the failures. From one cause or another, perhaps because, when not absorbed in the present, my thoughts are chiefly in the past, I have cherished the memory of many young men whom I have loved and lost. *Io victis!* let us sometimes sing of the vanquished. Let us sometimes think of those who have fallen in the battle of life, who have striven and failed, who have failed even without the strife. How many have I lost from the student band by mental death, and from so many causes—some still-born from college, others dead within the first year of infantile marasmus, while mental rickets, teething, tabes and fits have carried off many of the most promising minds! From improper feeding within the first five fateful years scurvy and rickets head the mental mortality bills of students. To the teacher-nurse it is a sore disappointment to find at the end of ten years so few minds with the full stature, of which the early days gave promise. Still, so widespread is mental death that we scarcely comment upon it in our friends. The real tragedy is the moral death which, in different forms, overtakes so many good fellows who fall away from the pure, honorable and righteous service of Minerva into the idolatry of Bacchus, of Venus or of Circe. Against the background of the past these trage-

dies stand out, lurid and dark, and as the names and faces of my old boys recur (some of them my special pride), I shudder to think of the blighted hopes and wrecked lives, and I force my memory back to those happy days when they were as you are now, joyous and free from care, and I think of them on the benches, in the laboratories and in the wards—and there I leave them. Less painful to dwell upon, though associated with a more poignant grief, is the fate of those whom physical death has snatched away in the bud or blossom of the student life. These are among the tender memories of the teacher's life, of which he does not often care to speak, feeling with Longfellow that the surest pledge of their remembrance is "the silent homage of thoughts unspoken." As I look back it seems now as if the best of us had died, that the brightest and the keenest had been taken, and the more commonplace among us had been spared. An old mother, a devoted sister, a loving brother, in some cases a broken-hearted wife, still pay the tribute of tears for the untimely ending of their high hopes, and in loving remembrance I would mingle mine with theirs. What a loss to our profession have been the deaths of such true disciples as Zimmerman, of Toronto; of Jack Cline and of R. L. MacDonnell, of Montreal; of Fred. Packard and of Kirkbride, of Philadelphia; of Oppenheimer and of Oehner, in Baltimore—cut off with their leaves still in the green, to the inconsolable grief of their friends!

To each one of you the practice of medicine will be very much as you make it—to one a worry, a care, a perpetual annoyance; to another, a daily joy and a life of as much happiness and usefulness as can well fall to the lot of man. In the student spirit you can best fulfil the high mission of our noble calling—in his *humility*, conscious of weakness, while seeking strength; in his *confidence*, knowing the power, while recognizing the limitations of his art; in his *pride* in the glorious heritage from which the greatest gifts to man have been derived; and in his sure and certain hope that the future holds for us still richer blessings than the past.

TWO EXPERIMENTS IN ARTIFICIAL IMMUNITY AGAINST TUBERCULOSIS.¹

BY E. L. TRUDEAU, M.D.,

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As the papers which have just been read relate to the difference of the pathological lesions produced in animals immunized against tuberculosis by attenuated living cultures, also to the value of agglutination in the various degrees of tuberculous infection and to the opsonic power of the blood of immunized compared with unimmunized animals, I am glad to avail myself of the privilege accorded me by your Chairman of describing to you two experi-

ments recently made by me which bear on artificial immunity against tuberculosis in small animals.

Many of you who have followed carefully the continued but apparently hopeless efforts to produce artificial immunity against this disease, in which clinically no acquired immunity seems to exist, and where one attack apparently does not protect from another, and who remember the many failures which have followed attempts at producing an antitoxic serum for tuberculosis or immunity against the disease by tuberculin or other products of the germ, may nevertheless have been struck with the fact that rather better results have been claimed at intervals during the past thirteen years by a certain class of experimenters.

I refer principally to the work done by de Schweinitz, Pearson and Gilliland, and Trudeau, in this country, that of MacFadyean in England, and of Behring, Neufeld, Baumgarten, and also Möller and Friedmann, in Germany. The distinctive feature of their work is that the immunity claimed, whatever its degree, is produced not by a toxin but by a preventive inoculation made with living but attenuated bacilli. These bacilli may depend for their attenuation either on the selection of a race of tubercle bacilli not naturally virulent for the animals to be protected, or on prolonged cultivation on artificial media which produces attenuation of virulence in the same variety of tubercle bacillus naturally virulent for the animal sought to be protected.

Marmorek and Maragliano still claim to produce antitoxic and bacteriolytic serums which are effectual when employed in the treatment of human tuberculosis, but sufficient time has not elapsed to establish the validity of their claims. In my own work the best results I have obtained in producing a relative but demonstrable degree of immunity, or at least increased resistance in small animals, have been brought about by the previous inoculations of living but attenuated cultures, and have been published at long intervals since 1893.

Rabbits and guinea-pigs, which I have always made use of, are by no means ideal animals for immunization, the guinea-pig being almost too susceptible, so that nothing more than relative immunity can be obtained with these animals; the rabbit, on the other hand, recovering very readily after a time from even intravenous inoculations of human tubercle bacilli, unless these be very virulent or the amount injected very large, so that the controls have a disagreeable way of making relative if not complete recoveries.

It having been demonstrated by de Schweinitz and myself that a human culture by prolonged cultivation lost its virulence for even such susceptible animals as guinea-pigs, and that its injection gave these animals a relative degree of immunity, I began over a year ago experiments

¹ Part of the Discussion at the Bacteriological and Pathological Section of the Meeting of the National Association for the Study and Prevention of Tuberculosis, May 18 to 19, 1905.

to try to throw more light on the nature of this very apparent protection. The first experiment I made was with a view to determining whether a living bacillus was necessary to the production of the highest degree of immunity attainable, or whether dead bacilli would be equally effective. Was the immunity a result of the struggle between the living bacillus and the cell, or was it merely the chemical products of the germ which were essential to success, living or dead? Was the immunity simply a toxin immunity, or was it a bacteriolytic or isopathic immunity which could be induced only by the substances resulting from the struggle between the living cells and the living but attenuated germs? The conditions of the experiment were as follows:

Guinea-pigs of the same weight were chosen. Twelve were injected in the left groin with one-half milligram attenuated, actively growing, human culture (R 1). The culture was then put in the steam sterilizer for fifteen minutes, and twelve more guinea-pigs were similarly inoculated. In a month they received one milligram of the same attenuated culture (living and dead) intraperitoneally. A month after the first vaccination the pigs injected with the living bacilli showed slight enlargement of inguinal glands, but nothing more. Those injected with the dead bacilli showed no evidence whatever of the inoculation. A month after the last protective inoculation they were all injected in the right groin, along with eight control animals of the same size, with one milligram virulent human tubercle bacilli. The last of the controls died in ninety days with gross and advanced cheesy lesions in glands, spleen, liver and lungs. At that time (ninety days) four of the pigs vaccinated with dead tubercle bacilli had died, and none of those vaccinated with living. One of the animals from each of the two lots of vaccinated pigs was then killed in order to compare their lesions with those of the controls. As you see in the painted photographs I show you, the lesions of the controls and those of the animals vaccinated with dead tubercle bacilli differ but little. They both have cheesy nodes, enormous cheesy spleens and livers, and the lungs are extensively invaded with cheesy tubercle. The difference in the gross appearance of the organs of the animal vaccinated with the living culture is, however, apparent at a glance; namely, though the nodes are enlarged, and the spleen moderately so, there is as yet no evidence of caseation recognizable to the naked eye. In other words, the animal is tuberculous, and would, like the rest of those in the same lot, have died ultimately of tuberculosis as they all do, but the living vaccination had a very decided and easily demonstrable influence in arresting the progress of the disease; an influence which proved to be undemonstrable in the animal vaccinated with the same culture previously killed by heat, but which nevertheless is

found to be present, though to a less degree, when the duration of life in a larger number of animals is considered.

The test inoculation in this particular lot of animals was more virulent and much larger than is best to use in order to demonstrate the immunity conferred by the vaccination, but that some slight protection is afforded even by the dead bacilli, under so severe a test, is apparent when the duration of all the animals' lives is considered. Thus the controls' average life was 70½ days; the average life of the animals vaccinated with dead bacilli 99 days, and with living bacilli 155 days. It would seem that a very marked protection is afforded by the living bacilli, and a very slight but still appreciable degree of increased resistance by the dead bacilli. Such evidence is important in its bearing on the treatment of tuberculosis by Bacillen Emulsion, some observers still maintaining that good results are obtainable from this treatment in the human being, though no very marked immunity is produced.

This experiment is no doubt open to the criticism that in killing the cultures by heat their chemical constituents may have been altered, and that if they could be killed by some method that would not in any way change their delicate chemical composition the dead bacilli would protect as well as the living. To obtain some evidence on this point another experiment was undertaken. Small amounts, one-tenth milligram, of dead bacilli killed by three hours' exposure to sunlight were injected at short intervals in pulverized form, and the protection afforded was less marked than where the heat-killed cultures were employed in two massive injections. Average life for nine controls, 87.4 days. Average life for twelve vaccinated, 95 days. The next experiment also gives some evidence rather tending to disprove this hypothesis.

During the past year Möller, and later, Friedmann, have used bacilli derived from or passed through cold-blooded animals as a protective inoculation, and have claimed marked results from these vaccinations in guinea-pigs and rabbits, much better results, it seems to me, than I was able to obtain with my attenuated tubercle bacilli of human origin. Möller used a tubercle bacillus culture which was derived from the frog, and one which had been passed through the blind worm. Both these cultures grew freely on glycerin peptone agar at room temperature, and Möller claimed that as they would not grow at the temperature of the human body, they were perfectly safe to use as a vaccine, an advantage which could not be said to be possessed by the bacillus of human origin and growing at the temperature of warm-blooded animals, only, no matter how attenuated it might have become by prolonged cultivation on artificial media in the thermostat.

These two varieties of cultures, the frog and the slow worm, Dr. Baldwin was enabled to

obtain from Dr. Möller, and they were grown in our laboratory at room temperature. I determined to make an experiment that would be likely to shed light, (1) on the degree of protection afforded by cultures of warm-blooded origin but attenuated by prolonged growth, as compared with that conferred by bacilli derived from cold-blooded creatures and which apparently die at once when introduced into warm-blooded animals. (2) To determine whether the degree of attenuation obtained by prolonged growth bears any relation to the degree of protection afforded; that is, whether a culture of human origin grown for over twenty years on artificial media, which produces now little or no appreciable local lesion and never tends to generalize itself, will protect as well as one also of human origin which has been cultivated for over fourteen years, and which still produces in all the guinea-pigs slightly enlarged inguinal nodes near the site of inoculation, and occasionally even—that is, in about one in ten animals—brings about a little caseation in such a node, with a tendency to become generalized only to the extent that bacilli in a few instances reach as far as the spleen. The former culture is designated K 1, and is one of the original cultures which Dr. Koch separated in his first work on tuberculosis. The second is my old R 1 culture, which I obtained from the human subject, and has grown, principally on glycerin peptone bouillon, about fifteen years.

On February 27, 1905, 48 guinea-pigs of the same size were separated into four groups, and each group received respectively, in the left groin, one-half a milligram of each of the following vigorously growing agar cultures: Lot I, human, R 1 culture; Lot II, human K 1 culture; Lot III, cold-blooded (frog), and Lot IV, cold-blooded (blind worm) culture. A month later one of each group was killed. Blind worm and frog guinea-pigs showed absolutely no lesion. K 1 animals show enlarged nodes, no caseation or tubercle bacilli. R 1, one or two enlarged nodes, slight caseation and a few tubercle bacilli. No other lesions anywhere. The animals were all tested with tuberculin, and only the Lot I, human culture R 1 pigs, gave any reaction indicating the presence of a slight tuberculous process.

March 27, thirty-three days after vaccination, all the vaccinated animals, together with twelve controls, were injected subcutaneously in right groin with one-tenth milligram virulent human tubercle bacilli culture. All the 55 animals were killed at the same time, May 10, or 44 days after the virulent inoculation, and having been divided in five lots, were laid out side by side for comparison. The animals of each lot were quite uniform in the character and extent of their lesions.

Lot I, Vaccinated R 1 Human, show enlarged and, occasionally, cheesy nodes, slightly enlarged spleen, abundant perirenal fat. No other

macroscopical lesions are visible, no tubercles or caseation.

Lot II, Vaccinated with K 1 Human, show caseous nodes and much larger spleen (over twice as large as Lot I); absence of perirenal fat marked in nearly half the animals, but no caseous tubercles, though a few gray tubercles could be seen in liver and lung in about one-third of the animals.

Lots III and IV, vaccinated with cultures from cold-blooded animals (frog and blind worm), as well as the controls, all show to about the same degree the usual picture of well-advanced generalized tuberculosis in the guinea-pig. Spleens about three times the size of Lot II, riddled with gray caseating tubercle. Entire absence of perirenal and lumbar fat, cheesy areas in liver, and gray tubercle in the lungs.

The controls and animals of Lots III and IV were in no way distinguishable, while any one of the animals, Lot I and Lot II, could have been picked out easily if thrown among controls, or victims vaccinated with cultures from cold-blooded animals.

This experiment seems to offer some interesting evidence. First, there is evidently a relation between the degree of protection and the attenuation of the culture used as a vaccine. The R 1 human, which from its production of local effects, enlargement of neighboring nodes containing bacilli, and slight tendency to generalization (bacilli having been found occasionally in the spleens of animals injected with this attenuated culture), protects better against subsequent virulent inoculation than the K 1 culture, which produced hardly any appreciable and purely localized effect, no bacilli being found to have penetrated even the inguinal glands near the inoculation spot.

The frog and blind worm bacillus, which causes no local disturbance at all, seemed to have no effect in protecting the vaccinated animals, for the lesions of these exactly resembled those of the controls. The conclusions to be drawn from both of these experiments would therefore seem to be, (1) that dead tubercle bacilli increase, though to a very slight degree, the animal's resistance to subsequent inoculation; (2) that the living attenuated bacillus gives a stronger degree of immunity than the same bacillus killed by heat; (3) that the degree of attenuation of the bacillus used as vaccine bears a distinct relation to the degree of protection it affords in guinea-pigs to subsequent inoculation with virulent human cultures. That a culture still capable of producing a very small amount of cell destruction, and of spreading to the neighboring inguinal nodes, gives better protection than one which produces hardly any appreciable and purely localized tissue changes; (4) that cultures derived from cold-blooded animals and which grow only at room temperature, as used above, have brought about no ap-

preciable degree of immunity. (5) the chemical changes produced in killing the bacilli by heat in the first experiment cannot wholly explain the lack of protective power of the vaccination with dead bacilli, for the K 1 human bacilli used in the second experiment, though they had not been killed by heat, failed to give as good protection as the R 1 human culture, which differed from it only in the degree of its virulence.

The evidence here presented would seem to be in keeping with what we know of the artificial immunizations. Toxin immunity, or immunity brought about with dead germs, is never as strong or as lasting as that produced through the medium of a living virus (passive and active immunity). Furthermore, the degree of the attenuation of the virus greatly influences the degree of immunity obtained.

My acknowledgments are due to Dr. E. R. Baldwin, Dr. Hugh Kinghorn, and Dr. A. H. Allen, who carried out these experiments for me.

STUDIES ON IMMUNITY IN TUBERCULOSIS: THE PROPERTIES OF THE SERUM OF IMMUNIZED RABBITS.

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AND

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PART I.

The following experiments were undertaken largely as a continuation of the work presented by Dr. Trudeau in 1903 before the Association of American Physicians.¹ It was desired to obtain if possible a closer insight into the mechanism of the specifically acquired resistance to a virulent human tuberculous infection produced in rabbits by previous intravenous inoculation with bacilli of weak virulence.

Briefly described, the observations previously made were that an intense and prolonged inflammatory reaction, both general and local, occurred in the vaccinated animals immediately following the virulent inoculation. This was not noted in the controls. Gradually this tuberculin-like reaction subsided and in many favorable cases the ultimate result was an almost complete absorption of the tuberculous foci and disappearance of the bacilli, while in the meantime the controls became progressively worse until a condition of chronic tuberculosis ensued.

The importance of an intimate knowledge of this immunity reaction is at once obvious to us. It might explain some phases of the clinical course of human tuberculosis in its relapses and pneumonic forms, and even furnish new viewpoints for a rational therapy. Furthermore as this vaccination has already been found useful in the bovine, one may not be skeptical of its possibilities in human application.

The first step naturally suggested was to follow from day to day the different stages of the reaction in comparison with control animals killed simultaneously. For this purpose 23 Belgian hares were first selected as nearly the same color and size as possible, and 13 were vaccinated by the inoculation of .0001 gm. from a broth culture (R1 human) intravenously. No apparent loss of health usually follows this dose unless the animals are already the subjects of some other infection such as coccidiosis, or septicemia (snuffles). Of this series one died from the effects of fighting. The virulent inoculation followed in two months. Two c.c. (.00235 gm.) of virulent human (H33) from nine days' serum cultures was given in the same way to 11 vaccinated and 10 controls, one of the former being reserved without inoculation. The animals were etherized and bled to death in pairs, from the first to the thirtieth day at intervals of several days. Later a second lot of 30 hares and rabbits were vaccinated and 25 inoculated in the same manner together with 20 controls. This series was killed from the fourteenth to the sixty-first day so that a fairly complete review of the pathological processes was obtained (see the paper by Dr. J. L. Nichols, Part II). In addition to the above a further series of five pairs was used, more especially for the study of the serum reactions.

Daily observations of the temperature for a month after the virulent inoculation were made on 10 pairs of the first series, the result of which indicated an average higher temperature for the vaccinated animals during the first ten days, but higher for the controls during the second ten days, after which both subsided; thus it coincided with the course of the inflammatory reaction as described in the pathological report.

Agglutination Tests.—The examination of the serums was made either on the day of the bleeding or within twenty-four hours. Various emulsions and extracts of tubercle bacilli were employed to test their agglutinating and precipitating powers, but the preparation employed mostly was an emulsion of pulverized bacilli, as described by Koch, but without the addition of phenol.

The lack of uniformity in successive emulsions of the homogeneous culture of Arloing and Courmont made the results with this method useless for comparison. Moreover, the serums showing most activity in sedimenting Koch's emulsion frequently failed to agglutinate the Courmont cultures and *vice versa*.

The pulverized bacillus emulsion was prepared by diluting one part of 1-1,000 Koch emulsion to three volumes with .85 per cent. NaCl, which made a weak opalescence. The tests were made in dilutions of 1 in 5; 1-10; 1-15; 1-20, or higher, when the serum proved active. Each tube contained a total volume of 1 c.c. and a small drop of toluol.

The readings were taken after twenty-four

¹ Trans. Association of American Physicians, Vol. XVIII, 1903.

hours in the incubator and only sedimentation with clearing was regarded as a positive reaction.

Weak emulsions of the homogeneous culture "A" obtained from Prof. Courmont as well as one of our own ("K") were made by diluting the one month broth cultures about four times with .85 per cent. NaCl. Observations were taken after two and five hours, the tubes being kept at room temperature.

The results of precipitation tests with filtered extracts of tubercle bacilli were uniformly negative.

Normal saline—NaCl .85 per cent.—and NaHCO_3 0.5 per cent. extracts of washed cultures from broth were prepared by digesting the bacilli for twenty-four hours at 45°C ., and filtering through the Berkefeld bougie.

The sedimentation produced in Koch's emulsion was, however, quite marked in most of the vaccinated serums from the third to the thirtieth day after the virulent inoculation, reaching a maximum of 1 in 50 dilution in two serums and apparently higher and more constant between the fifth and twelfth days. All were negative before inoculation and during the first two days, and after the thirtieth day following inoculation. Only 9 controls out of 26 gave any agglutinations, the highest being 1 in 20 on the ninth day.

A curious fact may here be noted in passing that of these nine controls reacting positively, six were found to have more or less coccidiosis of the liver and revealed very slight and unprogressive tuberculous lesions.¹ Because of the complications these animals may be excluded in comparison, and in general it may be stated that the controls were negative to the Koch agglutination test, although more frequently positive to the Courmont test. It would appear that the agglutinin in the coccidiosis animals was less specific, or a so-called "partial agglutinin" since its genesis depended upon the presence of the coccidiosis. This view is strengthened by the fact that no congestion was evident about the tubercles in these animals.² On comparison of the lung sections with the results of the serum tests we noted a correspondence of the stronger serum reactions with the more intense and extensive inflammatory appearances in the vaccinated animals.

The significance of this undoubted development of agglutinin in the vaccinated animals, far in excess of the controls, is obvious as an evidence of a specific reaction-product. Whether we must also regard it as having some important function in combating the infection is less certain at present.

Phagocytosis.—The publication of Wright and Douglas's³ work on the so-called "opsonin" in the tuberculosis serums naturally gave us the in-

centive to study the phagocytosis of tubercle bacilli as influenced by the serums of immunized and control rabbits before and after inoculation. According to Wright and Douglas, who worked exclusively with human serums, an increase of the number of living or dead tubercle bacilli, taken up by polynuclear leucocytes, could be demonstrated by counting the bacilli according to Leishman's method in the stained specimens, where the patient was undergoing a successful tuberculin treatment.

The technic was somewhat lengthy and difficult, and we found the rabbits' blood less adapted to the process than the human. After numerous trials we came to the conclusion that this method of determining comparatively the opsonic power of serum was of little value in rabbits unless considerable differences were found in the strength of the serums. When the serums were nearly the same, or even moderately variable in strength, the counts were very wide in their variation. The above tests were made with twenty animals of the second series.

The method of Leishman was first tried with blood taken directly from the ear vein during life and incubated fifteen minutes at 38.5°C . in a moist chamber on slides, with an equal volume of tubercle bacilli emulsion. The smears were then immediately dried and fixed, stained with aniline fuchsin fifteen minutes at 38°C .; decolorized with acid alcohol (0.5 per cent. HCl, alcohol 50 per cent.), and stained with Wright's blood stain. Counts of the tubercle bacilli in 20 to 80 polynuclear leucocytes were then made and averaged.

When the animals were killed the serum method was employed as described by Wright,¹ using washed leucocytes obtained sometimes from a healthy rabbit, but frequently from one of the inoculated animals. Two volumes of leucocytes suspended in normal NaCl, two volumes of centrifugalized serum and one of a standard emulsion of tubercle bacilli in 1 per cent. NaCl were measured in capillary pipettes and incubated 20 minutes at 40°C . The greatest difficulty was experienced in preparing uniform emulsions of tubercle bacilli on successive days. The most satisfactory method was found to be the use of homogeneous cultures grown on potato eight days, sterilized by boiling the entire tubes, and taking a large standard loopful of the moist growth which was rubbed up in 1.5 c.c. one per cent NaCl, and centrifugalized fifteen minutes in small tubes. These emulsions were generally free from clumps; others were not, nor could the same emulsion be used on successive days, even if it stirred up and re-centrifugalized without weakening it and thus making any comparison from day to day quite useless. At the best, the spontaneous clumping of the emulsions and the varying agglutinating powers of the serums made the counts of doubtful value for comparison on the same day. An

¹ This apparent insusceptibility or restraining influence in animals suffering from coccidiosis has often been noted by us, and has recently been mentioned by Libbertz and Ruppel in connection with other diseases in guinea pigs. Such animals appear to emaciate and die with but few apparent tuberculous foci, but often reveal extensive atrophy of the liver. Deutch med. Woch., No. 4 Jan. 26, 1905.

² Lancet, Oct. 24, 1904.

³ Wright and Douglas, London Lancet, Oct. 22, 1904.

inevitable variability in the number of leucocytes present and active is another source of fallacy.

By modifying the technic somewhat we were able to study the opsonic power of the serum of five immunized and four control animals whose blood was taken almost daily for four days preceding, and twenty days after, the virulent inoculation. Besides the latter, three healthy animals were used from time to time for comparison; agglutination tests were also made each day.

In this series about 1 c.c. of blood was drawn each day from the ear vein and the serum used within two hours.

Instead of incubating the specimens in the measuring pipettes, as described by Wright, we found it more convenient and the results better by employing miniature tubes into which the mixture was transferred after measuring. These "mixers" were placed in holes of a wooden block during incubation, like cribbage counters.

No marked difference was noted between vaccinated and control serums before and immediately after the virulent inoculation. Both sets showed considerable individual variations from day to day, but all were weaker on the first two days following infection. The vaccinated serums were usually below the controls in opsonic power from the beginning, and two pairs which had shown the greatest variation, when bled to death, revealed the typical differences elsewhere described between the lungs of the vaccinated and controls to a marked degree; one pair was killed on the sixteenth day, the other on the twentieth day. Both vaccinated serums sedimented Koch's emulsion 1-40 and 1-20, respectively; the controls were negative. If the intense reactive infiltration is regarded as an active phagocytosis, which it appears to be in part, the lower opsonic power of the serums may be accounted for by its exhaustion, though evolved in excess of that in the controls. On the other hand the higher opsonic value of the control serum and the excess of the agglutinin, simultaneously with lower opsonin in the vaccinated, are phenomena that need explanation.

No coincidence was noted in our experiments between the agglutination of Koch's emulsion and opsonic power, although the phagocytosis was generally more complete when the serum agglutinated the bacilli. Studies on the relations between the agglutinins and opsonic power are in progress.

As a final observation we may state that the intense reaction seen in vaccinated rabbits was observed only in the lungs, where doubtless most of the bacilli lodge; and in a few animals the reaction was evidently followed by such lowered resistance that instead of absorption large caseous areas developed, much more extensively than in the controls. Thus one cannot say that the method of vaccination always succeeds at last in destroying the bacilli and removing the tubercles, though it must be remembered that these

inoculations are extremely severe conditions for animals to withstand. Moreover, the absorption of foci in the controls was occasionally observed to nearly the same degree, and the presumption is that the mechanism is the same, but delayed and less active in unvaccinated animals.

STUDIES ON IMMUNITY IN TUBERCULOSIS: AN HISTOLOGICAL STUDY OF THE LESIONS OF IMMUNIZED RABBITS.

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PART II.

THE following examination was conducted for the purpose of demonstrating the histological differences in the formation and further progress of tubercles in previously vaccinated and in unvaccinated animals already described in Part I.

In former experiments by Dr. Trudeau¹ the great value of previous vaccination was shown by the survival, or greatly prolonged lifetime, of the vaccinated animals, and by the death of nearly all the unvaccinated. In those experiments a number of animals in each series were killed on the twenty-second day after the virulent inoculation, and microscopical examination made by Dr. Eugene Hodenpyl² showed a marked difference between the lungs of the vaccinated animals and those of the controls. The former were densely infiltrated and more congested than the controls, while vaccinated animals, killed some months later, revealed a remarkable absence of tuberculous foci and bacilli in the lungs, thus indicating an extensive absorption of the infiltration.

In order to try to follow the successive stages of this reaction the present experiment was conducted on the same lines, with the difference that one of each set of animals, i.e., vaccinated and unvaccinated, was killed at certain intervals after the virulent inoculation, varying from twenty-four hours to thirty days. The blood serum was tested for agglutinins by Dr. Baldwin, while the internal organs were given to me for microscopical examination.

The two sets of animals reacted differently to the virulent inoculation, the vaccinated showing for the first three or four days a distinctly higher temperature and greater general disorder. In the ensuing week, however, the condition was gradually reversed, the vaccinated animals

¹ Transactions Association of American Physicians, Vol. XVIII, 1903.

² Sections from some of these rabbits were made and examined by Dr. Hodenpyl with the following results, which agree substantially with my own:

a. Vaccinated rabbit; no virulent inoculation. Killed after eighty days; no trace of inoculation.

b. Control; killed twenty-two days after virulent inoculation: Many tubercle bacilli; little general reaction.

c. Vaccinated; killed twenty-two days after virulent inoculation; greater reaction; air cells full of exudate and epithelioid cells; less definite arrangement as tubercles; some caseation; numbers of tubercle bacilli.

d. Vaccinated; killed 110 days after virulent inoculation (controls had all died tuberculous); a few very minute scattered tubercles composed of few epithelioid cells and single hyaline capsule; a few larger tubercles with caseated centers; no tubercle bacilli; rest of lung tissue apparently completely restored to normal.

returning to a normal appearance without having lost flesh, while the unvaccinated began to decline.

This difference in reaction of the two sets of animals was still more marked on examination of the internal organs. For this purpose one of each set, selecting animals as nearly alike as possible, was killed, every twenty-four hours for the first three days; then on the fifth and eighth days; and thereafter, up to the thirtieth day, at intervals of about four days. The animals were killed by bleeding and the autopsy performed at once. Small selected pieces were taken from the lungs, liver, spleen, and kidneys, hardened in Orth's fluid, embedded in celloidin, and the sections stained; some in hematoxylin and eosin, others by the Ziehl-Neelsen method for tubercle bacilli.

Attention may be drawn to the fact that because these animals were killed at regular progressive intervals, it does not necessarily follow that the lesions will be found in exactly the same proportionate advance. We must allow for differences in the individual resistance, and some variation in the dose no matter how carefully given. However, the periods between each killing have been sufficiently long to allow some definite advance over the preceding ones in each succeeding set.

The following description will be confined to the lungs: I shall take up first a description of the general reaction in each case, and discuss afterward any difference in the specific elements of tubercle formation.

At the end of twenty-four hours, there is a difference between the lungs of the vaccinated and control, evident to the naked eye. The latter appear unchanged. The former are congested and somewhat denser than normal, and scattered through the tissues, or just beneath the pleura, are small punctate hemorrhagic spots. On distention of the lung with fluid these spots for the most part disappear.

Under the microscope we find in both sets of animals the bacilli of the virulent inoculation pretty evenly scattered through the section as small clumps in the capillaries, forming a thrombus composed of bacilli, fibrin and many leucocytes. In the control the reaction has extended little further than this. In the vaccinated animal, however, the way seems to have been prepared for an immediate and powerful reaction. All capillaries throughout the section are greatly congested, and contain many leucocytes. About the foci of bacilli the congestion is very intense, and at some points small hemorrhages have occurred. There is already some exudate containing a number of "epithelioid" cells; i.e., cells with large, clear vesicular nuclei; and similar cells may be seen in the alveoli adjoining the tubercle. These latter are probably in part desquamated epithelium.

In the vaccinated animals, during the next two days, the number of these characteristically

formed tubercles has materially increased, as well as their size. The "epithelioid" cells in the center of the tubercle contain numbers of tubercle bacilli. Occasionally these cells containing tubercle bacilli are seen in a neighboring alveolus, or capillary. The bacilli are thus more or less scattered, and are beginning to lose their brilliant stain and regular contour. There is also some evidence of nuclear fragmentation, and a clearer zone in the center of the tubercle, but no sign of necrosis.

In many places the newly formed cells have either coalesced, or their protoplasm has not divided, and we find giant cells made up of a large mass of protoplasm containing several more or less centrally placed, large, vesicular nuclei, and sometimes a number of tubercle bacilli.

At the end of the fifth day we find the lungs of the vaccinated animal very voluminous (not collapsible), very much congested, and speckled with large and small hemorrhagic spots, one or two as large as a pea. Numbers of minute, translucent tubercles can be plainly seen with the naked eye. Under the microscope these differ from an ordinary tubercle of the same size in the unusual amount of exudate and epithelioid cells; in the apparent degeneration of the bacilli in the center of each, and in the spread of exudate and number of "epithelioid" cells to the intervening septa and alveoli. The margins of these tubercles are intensely injected with blood, which, in many places, has escaped from the capillaries.

Where several tubercles are adjacent this congestion and extravasation cover quite a large area and become visible to the naked eye as the hemorrhagic spots already spoken of.

So far the controls have remained much the same as on the first day. The control of this date, the fifth day, shows only slightly greater congestion and density of the lungs than normal. There are no tubercles visible to the naked eye. Under the microscope numerous small tubercles can be made out, varying greatly from the vaccinated in that they are much smaller, contain little exudate, almost no cells of the epithelioid type, and many brightly staining tubercle bacilli, showing no signs of degeneration or inclusion in phagocytes. There is little or no reaction in the intervening septa.

It was thought the hemorrhagic spots spoken of might be due to the remains of the previous vaccination, as they were noticed only in the vaccinated animals, and were so pronounced and constantly present. Therefore, an extra vaccinated animal, which had received no virulent inoculation, was injected with 50 mg. tuberculin, at the same time as an unvaccinated animal which had received a test intravenous inoculation of the virulent culture three weeks previously. Both were killed on the following day. The former showed no reaction to the tuberculin; the latter, a slight one. On section the lungs of the vac-

minated showed no hemorrhagic spots, and under the microscope no trace of the original vaccination could be found, except one or two very minute clumps of newly formed connective tissue cells, enclosing a couple of old, degenerate-looking tubercle bacilli, all that had remained of the vaccination at the end of sixty-eight days. The lungs of the second animal contained easily visible tubercles, well circumscribed, and with beginning caseation and numerous tubercle bacilli in the center, and a zone of hypercongestion about the periphery, perhaps due to the tuberculin. The hemorrhagic spots, therefore, are evidently a part of the intense reaction produced in the vaccinated animals by the injection of the virulent organism, and not due to any remains of the original vaccination.

The ensuing six pairs of animals were killed at intervals of about four days, and are especially interesting, as this period, from the fifth to the thirtieth day, seems to complete the mastery of the infection by the vaccinated animals and to usher in the final stage to complete absorption of all these inflammatory products, while in the unvaccinated animals the infection progresses gradually to the formation of chronic tuberculous lesions.

If we examine the lungs of the first of these vaccinated animals killed nine days after the virulent inoculation, we are struck by their great alteration, and would be inclined to conclude that the animal was under the influence of a very severe infection. The lungs are very dense and voluminous, do not collapse, are mottled, dusky pink in color, with here and there very dark red hemorrhagic spots. The surface is very irregular, where numerous, sometimes coalescing tuberculous nodules protrude. On carefully examining these they are seen to be of a somewhat more translucent, opalescent appearance than in the control. The lungs of the control of this date present very little alteration to the naked eye. They collapse a good deal, and are only slightly more congested than normal lungs. On careful examination minute, dense, gray-looking tuberculous nodules, scarcely perceptible to the touch, are visible to the naked eye, scattered through the lung tissue. On examining the lungs of the vaccinated animals under the microscope we find the large, opalescent, irregular nodules to be composed of several small, well-defined tubercles, bound together by a mass of exudate, epithelioid and desquamated cells, which fill up the adjoining alveoli and septa, the whole surrounded and permeated by extravasated blood, and highly congested capillaries, which are also packed with leucocytes. The whole has more the appearance of a pneumonia than the gradual, newly forming connective tissue of an ordinary tuberculous process of the same extent. The individual tubercles are filled with large epithelioid cells, with pale vesicular nuclei, with some polymorphonuclears, loosely held together by a plentiful homogeneous exudate. In the center

of these is some nuclear fragmentation, but no appearance of beginning caseation. In this portion only are tubercle bacilli to be found, and there are very few indeed, and nearly all fragmented and degenerate-looking. All through these small nodules of exudate, cells and minute tubercles are seen many karyokinetic figures, and giant cells of the type spoken of above, evidences of great cell activity. All sizes and shapes of nuclei are to be seen. The tubercles in the control of this date are much like the previous one, and consist mainly of conglomerate small areas of leucocytic infiltration, containing little exudate, and few epithelioid cells, but many brightly staining, clearly defined bacilli.

The next two succeeding vaccinated animals, killed on the twelfth and seventeenth days, resemble very closely the preceding one. There is, however, a marked diminution in the number of tubercle bacilli, and in the latter one they are exceedingly hard to find. On the twenty-second day the gross appearance has little changed, but on microscopical examination we find a slight clearing up of the cellular exudate in the intermediate tissue, and that the tubercle bacilli have apparently disappeared. The small tubercles are often sharply circumscribed by a single layer of epithelioid cells, and there is, as before, much extravasation of blood within and surrounding them. All these last three animals showed a good deal of cellular detritus in the smaller bronchioles, and occasionally tubercle bacilli could be seen within some of these cells.

In the remaining two vaccinated animals a remarkable change has taken place in the absorption of the cellular exudate from the septa and alveoli lying between the small tubercles, so that this portion of the lung has nearly returned to its normal appearance. The tubercles themselves seem to be breaking up, the central portion dissolving out, while the peripheral capillary ring is reduced to slightly congested vessels, and a number of darkly staining leucocytes. Many of these tubercles have been reduced to nothing more than a few large, pale vesicular cells, surrounded by a small capillary ring whose limits are somewhat emphasized by a greater number of nuclei than normal.

As to the controls, it will be remembered that those up to the seventeenth day showed no very marked reaction. At this date, however, there is a marked advance. In gross appearance they are denser, grayer-looking than in the vaccinated; they are smaller and more sharply marked off from the surrounding tissue. Under the microscope these nodules are composed, like the vaccinated, of several small tubercles joined together by a cell infiltration. Their character, however, differs somewhat. There is less exudate, fewer epithelioid cells, more deeper staining leucocytes, and more cells resembling new connective tissue corpuscles. These last are especially marked in the intervening substance, which thus has a firmer, less succulent appearance. There is also

some karyokinesis. What is of more importance, there are, in the central portion of the individual tubercles, considerable fragmentation and necrosis, and numerous brightly staining tubercle bacilli. Few of these are within cells. In the next succeeding control, killed twenty-five days after inoculation, there is more fragmentation in this portion, with beginning caseation and many bacilli. In the intervening tissue are found numerous fibrous tissue corpuscles, and many giant cells of the small darkly staining eccentric nuclei type generally seen in beginning fibrous tuberculous tissue. In the last control a similar condition exists, though some of the tissue in between these conglomerate tubercles has cleared up, and rarely we may find a small tubercle undergoing resolution. The bacilli are still present in large numbers. It is to be regretted that more animals were not used in this experiment, so that the virulent infection could have been followed in its further stages.¹

As an ultimate result then, at the end of thirty days, the lungs of the vaccinated are practically free from tubercle bacilli, and nearly entirely cleared of all signs of their invasion; in the controls, on the other hand, the great majority of the tubercles are still progressing, undergoing fragmentation and caseation, and containing many tubercle bacilli in their centers, while their periphery and intervening substance are apparently undergoing a change into more durable fibrous tissue.

Of the elements more or less specific of tubercle formation, I will consider, before closing the giant cells, the "epithelioid" cells and, lastly, the tubercle bacilli.

From the foregoing it will already have been noticed that giant cells of the type represented by a mass of protoplasm containing two or more nuclei, more or less centrally placed, appear in the vaccinated as early as the third day, and continue until the twenty-fifth, reaching their maximum in the seventeenth day, when also some giant cells of more eccentric type accompany them, and a good deal of evidence of cell division. In the controls, on the other hand, giant cells do not make their appearance until the twenty-fifth day, and are then nearly all of the type with eccentric dark staining nuclei seen in fibrous tuberculous tissue. It seems probable that the presence and numbers of giant cells of the vesicular nuclei type, like the nuclei of the "epithelioid" cells, have some dependence on the rapid appearance of large numbers of these cells at the foci of disease in the vaccinated animals.

These epithelioid cells, which appear in the earliest specimens of the vaccinated animals have a good deal of protoplasm, and large vesicular nuclei. It seems hardly likely that they are produced so quickly and in such large numbers from local elements. It is more likely that they come

with the excessive exudate from the blood, containing vast numbers of leucocytes. These "epithelioid" cells possess great phagocytic power. From as early as the second day, many may be seen containing four or more tubercle bacilli, mostly in the tubercles, sometimes in an adjacent capillary or alveolus, and later in the smaller bronchioles. This is also true of the giant cells of this type.

The tubercle bacilli show early signs of degeneration in the vaccinated animals, and rapidly diminish between the fifth and ninth days, to disappear almost entirely by the thirtieth day. In a few sections, however, of the vaccinated animals, in spite of the care with which the emulsion was made, a very large clump of tubercle bacilli had lodged, making a more resistant focus, and out of all comparison with the surrounding process. These can be disregarded.

In the controls, on the other hand, although some tubercle bacilli are undoubtedly taken up and destroyed, they are still present in all the specimens in considerable numbers, and in the thirtieth day may be found, apparently little diminished in numbers and virulence, about the fragmentation and caseation which has begun to make its appearance.

In conclusion, then, it may be said about this manner of vaccination, that, within a given time at least, it prepared the way for an immediate and powerful reaction. Apart from the speed and intensity with which it develops, and the proportionate excess of exudate, and of epithelioid elements, this tubercle does not differ in cellular character from the tubercle of the control. It does differ, however, in its ultimate result in that it effects the death of the tubercle bacilli within it, and ends by being completely absorbed. It does not go on to caseation nor the formation of chronic tuberculous tissue. The reason for this must be sought in an increased bactericidal power of the exudate; in the increased capacity or numbers of the phagocytes, the "epithelioid" cells, or, as recent work has shown, a combination of both of these elements.

In these sections it was very difficult to determine the exact boundaries of the cells, and whether the bacilli were actually within or without them, so that a definite difference in phagocytosis between the vaccinated and controls was difficult to determine. Certainly there were much earlier definite evidences of it in the vaccinated, and it was easier to find cells that evidently contained bacilli in those specimens.

Effect of Digitalis on the Normal Heart.—If medicinal doses of digitalis or strophanthus are given to normal individuals, a distinct slowing of the pulse will be obtained quite regularly, yet the blood-pressure remains within normal limits. A. FRAENKEL (*Munch. med. Woch.*, Aug. 8, 1905) finds however, that the blood-pressure will rise above the normal if the drug is given with atropine. It follows that the slowing of the pulse is the factor which acts against a rise in pressure.

¹ The study of the stages up to the sixty-first day was made later on with the second series (See Part I), and in some animals absorption was still in progress on the fiftieth day; otherwise nothing new was developed.

THE VITALITY OF TUBERCLE BACILLI IN SPUTUM.

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THIS experiment was undertaken to prove how long the tubercle bacillus would live in sputum under natural conditions, it being of interest to know for how long a period the tubercle bacillus in sputum, in articles such as handkerchiefs or in rooms or public places, may retain its vitality, and relative to the question as to the danger of sputum as a cause of infection.

Villemin¹ found that dried sputum preserved its virulence after several weeks. Experiments of Koch,² Schill,³ Fischer and others, have shown that the bacilli retained their vitality in desiccated sputum for several months (nine to ten, De Thoma⁴) but they are said to undergo a gradual diminution in pathogenic virulence, which is more rapid when the desiccated material is kept at a temperature of 30° to 40° C. Koch dried sputum at the temperature of the laboratory for four to eight weeks and found it still would produce tuberculosis in animals.⁵ In his address before the Tenth International Medical Congress, Berlin, 1890, he stated that when exposed to direct sunlight the tubercle bacilli are killed in from a few minutes to several hours, according to the thickness of the layer. He also stated that they are destroyed by diffuse daylight in from five to seven days when placed near a window.

Malassez and Vignal⁶ found that sputum alternately dried and moistened for twelve days was yet virulent. Sawizky⁷ found that sputum, subjected to the ordinary conditions of the floors of a dwelling house preserved its virulence for a period of two to two and one-half months, and that there was no difference between the sputum obtained from dark corners and that which had been exposed to the sun's rays.

Migneco⁸ found that sputum dried on handkerchiefs in the sunlight preserved its virulence for eighteen hours, whereas dried on woolen cloth in sunlight preserved its virulence for thirty hours.

Dr. Arthur Ransom⁹ and Mr. Sheridan Delepine, in a series of experiments, found that sputum exposed to light and air for forty-five days in June and July did not produce tuberculosis when inoculated into rabbits; that sputum exposed in an air shaft at dusk during the same season produced slight tuberculosis; that the same sputum exposed at the same time to light and air produced no tubercle in a guinea-pig. The same methods employed, only at dusk, produced advanced tuberculosis. Another sputum exposed in April for sixteen days to little or no air in darkness, produced well-marked tuberculosis. Sputum dried on paper for twenty-four hours and placed in a dark, close cupboard for one day produced well-marked tuberculosis.

Sputum kept under the same conditions and exposed to a little air for thirty-five days produced distinct local tuberculosis. Sputum placed in the air shaft of a draught-closet in a dim light, pure air passing through it for three days at ordinary temperature, caused well-marked tuberculosis. Sputum exposed to light for three days, with an hour of sunshine, good ventilation, and a maximum temperature of 50° F., produced no tuberculosis. Other sputum exposed to light for seven days, with fifteen hours of sunshine and brisk ventilation, did not cause tuberculosis. Again, sputum exposed to the light for two days after having been kept dried for four weeks (there had not been much exposure to sunshine and ventilation had been slight) produced no tuberculosis.

Cornet¹⁰ says, "After about six months expectorated material contains not a single germ capable of further development."

The material used in our experiment was obtained by mixing in equal proportions the sputum of two patients, in whom the disease was actively progressing, so as to make reasonably sure of obtaining a virulent, strongly growing organism.

The number of bacilli present in the sputums used showed from vii to viii on Gaffky's scale.

The sputum from each patient was first tested by injecting 0.5 c.c. into the groins of two guinea-pigs. Ninety-one days later the first pig was killed. The pig was emaciated and showed a large open ulcer in the right groin. Tubercle bacilli were obtained from the ulcer. The inguinal glands were enlarged and caseated, and the spleen showed tubercles. After one hundred days the second pig was killed. On autopsy it showed generalized tuberculosis.

The following are the conditions in which the sputum was placed:

First.—Sputum deposited in sterilized, corked and paraffined white glass bottles (the bottles were 3 cm. in diameter and a depth of about 1 cm. of the mixed sputum was placed in each bottle); A, in a dark moist box; B, in a dark closet; C, in the diffuse light of an ordinary room; D, in the sunlight on glass plates (a fairly thin layer of sputum on a Petri dish); E, in the thermostat.

Second.—Sputum deposited in sterilized white glass bottles stoppered with cotton; A, in a dark, moist box; B, in a dark closet; C, in the diffuse light of an ordinary room; D, in the thermostat.

Third.—Sputum deposited in sand in sterilized white glass bottles: A, in a dark, moist box; B, in a dark closet; C, in the diffuse light of an ordinary room. Bottle corked and paraffined. D, in the diffuse light of an ordinary room. Bottle not sealed. E, in the thermostat. Bottle not sealed. F, in the thermostat. Bottle corked and paraffined.

Fourth.—Sputum deposited under ordinary room conditions on: A, handkerchief (folded); B, carpet; C, wood; D, woolen blanket (folded).

Fifth.—Sputum deposited in the open air during the winter months, in open, white glass bottles.

Sixth.—Sputum deposited in sterilized, white glass bottles, corked and paraffined; buried in the ground.

Seventh.—Sputum deposited in sterilized, white glass bottles, packed with ice, corked and paraffined, frozen in blocks of ice.

In the experiment with sputum exposed to sunlight, the specimens when not actually exposed to the sun's rays were kept in a dark box.

The experiment with the sputum placed in sand was not satisfactory. Many pigs died early of septicemia. The sand was not sterilized, and the reclaiming of the sputum from the sand was not certain.

The experiment with the sputum placed in blocks of ice was not entirely satisfactory, as it

The following tables show the results of our experiments on the vitality of the tubercle bacillus in sputum under the various conditions as heretofore detailed:

Results were negative in the following instances: With the sputum in glass bottles, stoppered with cotton, placed in the diffuse light of an ordinary room (IIc), the pigs inoculated at the end of 88 and 100 days died of unknown cause a few days after the injection. With the sputum in glass bottles stoppered with cotton, placed in the thermostat (IIId), no pig was inoculated between 21 days and 101 days, so that experiment was of no use as a comparison with the other specimens of that set. None of the results with the sputum in sand (III) was entirely satisfactory, owing to the death of many pigs from septic infection a few days after inoculation.

The results were negative in the case of the sputum buried (VI). The pig inoculated after 102 days died at the end of two weeks with no sign of tuberculosis.

Conditions of Experiment.	Time of exposure of Sputum. Days.	Death.		Results of Autopsy.							Result +
		Days after injection.	Cause.	Glands.			Lungs.	Spleen.	Liver.	Kidneys.	
				Inguinal.	Retroperitoneal.	Smears.					
Ia.	108	53	Killed	Enlarged	Enlarged	+	o	+	o	o	+
Sputum in corked and paraffined white glass bottles.	141	37	Killed	Casated	Casated	+	o	+	o	o	+
	170	16	Killed	Enlarged	Enlarged	+	o	o	o	o	+
	188	42	Killed	Casated	Casated	+	o	o	o	o	+
Dark moist box.	188	42	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
	196	42	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
Ib.	137	41	Killed	Enlarged	Enlarged	+	o	o	o	o	+
Sputum in corked and paraffined white glass bottles.	160	25	Killed	Casated	Enlarged	+	o	o	o	o	+
	188	42	Killed	Casated	Not enlarged	o	o	o	o	o	o
Dark closet.	196	42	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
Ic.	124	21	Undetermined	Enlarged	Not enlarged	+	o	o	o	o	+
Sputum in corked and paraffined white glass bottles.	175	32	Killed	Casated	Not enlarged	o	o	o	o	o	o
	189	43	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
Diffuse light. Ordinary room.											

was not possible to keep the bottles frozen solid. At stated intervals, the sputum under these various conditions was tested by subcutaneous injection into the groins of guinea-pigs. 0.25 c.c. of the sputum was injected into both groins of each pig, and was introduced by a glass hypodermic syringe. The site of injection was washed with five per cent. carbolic acid, and the syringe was carefully boiled between each injection.

One pig was inoculated with each sample of sputum to be tested. If at the end of two to three weeks there was no enlargement of glands, a second pig was inoculated with the same material. After a certain length of time, usually from a month to six weeks, pigs, if still living, were killed. At autopsy, smears from glands and tubercles were made and examined under the microscope.

This inoculation could not be repeated, as the specimen was destroyed by mistake.

Summary.—(Ia) The tubercle bacilli in the sputum in paraffined bottles placed in a dark, moist box, were alive and produced a tuberculous lesion in a guinea-pig at the end of 170 days. No tuberculous lesion was produced after 188 days.

(Ib) With the sputum in paraffined bottles, placed in a dark closet, a lesion resulted after 160 days, but not after 188 days.

(IIa) With the sputum in bottles stoppered with cotton, placed in a dark, moist box, a lesion resulted after 157 days, but not after 172 days.

Ic) With the sputum in paraffined bottles, placed in the diffuse light of an ordinary room, a lesion resulted after 124 days, but not after 175 days.

(VII) With the sputum in ice a lesion resulted after 102 days, but not after 153 days.

(IIIc) with the sputum in sand, in a moist, light place, a lesion resulted after 123 days, but not after 148 days.

(IIb) With the sputum in bottles stoppered with cotton in a dark closet, a lesion resulted after 100 days, but not after 141 days.

(V) With the sputum in open bottles, placed

out of doors in the winter months, a lesion resulted after 110 days, but not after 132 days.

(IVa) With the sputum in a handkerchief, a lesion resulted after 70 days, but not after 110 days.

(IVd) With the sputum in a woolen blanket, a lesion resulted after 70 days, but not after 110 days.

(IVc) With the sputum on wood, a lesion resulted after 70 days, but not after 110 days.

Conditions of Experiment.	Day of Experiment.	Hours in direct sun rays.	Death.		Results of Autopsy.								Result + or -
			Days after injection.	Cause.	Glands.			Lungs.	Spleen.	Liver.	Kidneys.		
					Inguinal.	Retroperitoneal.	Smears.						
Sputum on glass plates in sunlight.	1	1	40	Killed	Enlarged Caseated	Enlarged Caseated	+	o	+	o	o	+	
	1	7	42	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o	
	10	24½	40	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o	

Conditions of Experiment.	Time of exposure of Sputum. Days.	Death.		Results of Autopsy.								Result + or -
		Days after injection.	Cause.	Glands.			Lungs.	Spleen.	Liver.	Kidneys.		
				Inguinal.	Retroperitoneal.	Smears.						
Is.	33	40	Killed	Enlarged Caseated	Enlarged Caseated	+	o	o	o	o	+	
Sputum in corked and paraffined white glass bottles in thermostat.	100	40	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o	
	115	42	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o	

Conditions of Experiment.	Time of exposure of Sputum. Days.	Death.		Results of Autopsy.							Result + or -
		Days after injection.	Cause.	Glands.			Lungs.	Spleen.	Liver.	Kidneys.	
				Inguinal.	Retroperitoneal.	Smears.					
IIa. Sputum in white glass bottles, stoppered with cotton. Dark moist box.	108	53	Killed	Enlarged Caseated	Enlarged Caseated	+	o	o	o	o	+
	141	38	Killed	Enlarged Caseated	Enlarged	+	o	o	o	o	+
	157	42	Killed	Enlarged Caseated	Enlarged	+	o	+	o	o	+
	172	40	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
	190	43	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
IIb. Sputum in white glass bottles, stoppered with cotton. Dark closet.	61	76	Killed	Enlarged Caseated	Enlarged Caseated	+	o	o	o	o	+
	100	61	Killed	Enlarged Caseated	Enlarged	+	o	+	o	o	+
	141	32	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
	161	40	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
IIc. Sputum in white glass bottles, stoppered with cotton. Diffuse light. Ordinary room.	33	40	Killed	Enlarged Caseated	Enlarged	+	o	+	o	o	+
	109	31	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
	132	30	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o

Conditions of Experiment.	Time of exposure of Sputum. Days.	Death.		Results of Autopsy.							Result + or -
		Days after Injection.	Cause.	Glands.			Lungs.	Spleen.	Liver.	Kidneys.	
				Inguinal.	Retroperitoneal.	Smears.					
III d.	31	49	Killed	Enlarged Caseated	Enlarged	+	o	+	o	o	+
Sputum in white glass bottles stoppered with cotton in thermostat.	101	17	Undetermined	Not enlarged	Not enlarged	o	o	o	o	o	o
	132	46	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
	157	40	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o

Conditions of Experiment.	Time of exposure of Sputum. Days.	Death.		Results of Autopsy.							Result + or -
		Days after injection.	Cause.	Glands.			Lungs.	Spleen.	Liver.	Kidneys.	
				Inguinal.	Retroperitoneal.	Smears.					
IIIa. Sputum in sand. Moist dark box.	108	49	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
	171	49	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
IIIb. Sputum in sand. Dark closet.	62	78	Killed	One slightly Enlarged	Not enlarged	o	o	o	o	o	o
	108	49	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
IIIc. Sputum in moist sand. Diffuse light. Ordinary room.	77	53	Killed	Enlarged Caseated	Enlarged Caseated	+	o	+	o	o	+
	123	21	Killed	Enlarged Caseated	Not enlarged	+	o	o	o	o	+
	132	17	Undetermined	Slightly Enlarged	Not enlarged	o	o	o	o	o	o
	148	40	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o

Conditions of Experiment.	Time of exposure of Sputum. Days.	Death.		Results of Autopsy.							Result + or -
		Days after injection.	Cause.	Glands.			Lungs.	Spleen.	Liver.	Kidneys.	
				Inguinal.	Retroperitoneal.	Smears.					
III d. Sputum in dry sand.	30	76	Killed	Enlarged	Enlarged	+	o	o	o	o	+
Diffuse light. Ordinary room.	70	39	Killed	Caseated Not enlarged	Not enlarged	o	o	o	o	o	o
III e. Sputum in dry sand in thermostat.	30	79	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
III f. Sputum in moist sand in sealed bottle in thermostat.	62	47	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o

Conditions of Experiment.	Time of exposure of Sputum. Days.	Death.		Results of Autopsy.							Result + or -
		Days after injection.	Cause.	Glands.							
				Inguinal.	Retroperitoneal.	Spleen.	Lungs.	Spleen.	Liver.	Kidneys.	
IVa. Sputum on handkerchief, folded.	31	99	Killed	Enlarged	Enlarged	+	+	+	+	o	+
	70	39	Killed	Casated	Casated	+	o	+	o	o	+
	110	35	Killed	Enlarged	Enlarged	o	o	o	o	o	o
	115	40	Killed	Casated	Casated	o	o	o	o	o	o
IVb. Sputum on carpet.	38	91	Killed	Enlarged	Enlarged	+	+	+	+	o	+
	70	30	Killed	Casated	Casated	o	o	o	o	o	o
	88	38	Killed	Not enlarged	Not enlarged	o	o	o	o	o	o
IVc. Sputum on wood.	39	67	Killed	Enlarged	Enlarged	+	o	o	o	o	+
	70	60	Killed	Casated	Casated	+	o	+	o	o	+
	110	36	Killed	Enlarged	Enlarged	o	o	o	o	o	o
	130	36	Killed	Casated	Casated	o	o	o	o	o	o

Conditions of Experiment.	Time of exposure of Sputum. Days.	Death.		Results of Autopsy.							Result + or -		
		Days after infection.	Cause.	Glands.					Lungs.	Spleen.		Liver.	Kidneys.
				Inguinal.	Retroperitoneal.	Smears.							
IVd. Sputum on woolen blanket, folded.	39	67	Killed	Enlarged	Enlarged	+	o	o	o	o	+		
	70	60	Killed	Casated	Enlarged	+	o	+	+	o	+		
	110	31	Killed	Enlarged	Enlarged	o	o	o	o	o	o		
	131	42	Killed	Casated	Not enlarged	o	o	o	o	o	o		

Conditions of Experiment.	Time of exposure of Sputum. Days.	Death.		Results of Autopsy.							Result + or -
		Days after injection.	Cause.	Glands.							
				Inguinal.	Retroperitoneal.	Smears.	Lungs.	Spleen.	Liver.	Kidneys.	
V. Sputum in open white glass bottles, outdoors, winter months.	31	47	Killed	Enlarged	Enlarged	+	o	o	o	o	+
	110	38	Killed	Casated	Enlarged	+	o	+	o	o	+
	131	38	Killed	Enlarged	Enlarged	o	o	o	o	o	o
	164	40	Killed	Casated	Not enlarged	o	o	o	o	o	o
VI. Sputum in corked white glass bottles buried in ground.	23	40	Killed	Enlarged	Enlarged	+	o	+	o	o	+
	108	13	Undetermined	Casated	Not enlarged	o	o	o	o	o	o
VII. Sputum in blocks of ice.	109	39	Killed	Enlarged	Slightly Enlarged	+	o	o	+	o	+
	136	14	Undetermined	Casated	Not enlarged	o	o	o	o	o	o
	155	42	Killed	Slightly Enlarged	Not enlarged	o	o	o	o	o	o

(Ic) With the sputum in paraffined bottles, in the thermostat, a lesion resulted after 33 days, but not after 100 days.

(IVb) With the sputum on carpet, a lesion resulted after 39 days, but not after 70 days.

(IIIId) With the sputum in sand, in a dry, light place, a lesion resulted after 30 days, but not after 70 days.

(Id) With the sputum exposed to direct sun rays, a lesion resulted after one hour, but not after seven hours.

It appears that the conditions most conducive to the prolonged life of the tubercle bacillus in sputum are darkness and moisture. In our experiment, the bacilli under these conditions were alive at the end of five and a half months. Dryness hastens their destruction. A temperature of about 37° C. is less favorable for them than ordinary room temperature. A temperature near the freezing point is less favorable for them than ordinary room temperature. The direct sun rays kill them in a few hours.

My acknowledgments are due to Dr. E. L. Trudeau for the opportunity to try this experiment, to Dr. Lawrason Brown for suggesting it, and to Mr. Edgar J. Higgins and Dr. A. M. Forster for their kind assistance.

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THE SERUM DIAGNOSIS OF TUBERCULOSIS.¹

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AFTER it was found that the serum of animals that had been injected with bacteria possessed agglutinating power over the same bacteria, and that the serum of man agglutinates typhoid, cholera, and plague if he suffers from typhoid, cholera, and plague, it was suggestive that the blood of tuberculous individuals would agglutinate tubercle bacilli. But tubercle bacilli offer a great obstacle to such an investigation, because they form in their cultures compact masses, which are already, to some extent, in an agglutinated condition.

Arloing overcame this difficulty by cultivating the bacilli for a considerable time on potatoes, till the cultures obtained a smooth appearance. He then transferred them to the beef broth with six per cent. glycerin. In this way he finally obtained a culture that grew evenly distributed

throughout the liquid; that is to say, the culture became homogeneous.

Together with Paul Courmont, he found that homogeneous tuberculous cultures can be agglutinated by the serum of several kinds of animals, when these animals are inoculated by tuberculin or by attenuated cultures of tubercle bacilli. They also found that the normal blood serum of certain animals is able to agglutinate the homogeneous cultures, but with much less activity than when these animals are infected with the tubercle bacillus, or injected with its products.

A sufficient number of tests were made on human beings to convince them that the serum agglutination can be used in the diagnosis of tuberculosis, and they regard the test of equal value to Koch's tuberculin.

Many scientists of various nationalities have made publications absolutely confirmative and based on a large number of cases. Other investigators, and particularly in Germany, have obtained very different results. At the present time, however, the serum-agglutination test for tuberculosis is still in doubt.

The chief objections to the test are due to the following facts; namely, that the serums of quite a number of healthy individuals and of patients with other diseases are able to agglutinate homogeneous tuberculous cultures, and also that in some patients with well-marked symptoms of tuberculosis in the incipient or advanced stages the reaction is wanting.

In spite of these contradictory results Arloing and Courmont still firmly maintain that an individual whose blood serum agglutinates a homogeneous tuberculous culture at 1 to 5 is tuberculous, and if at 1 to 10 he is tuberculous without a doubt; and that the serum reaction reaches its highest grade of intensity when the lesions are slight.

The contradictory results are partly due to the differences in the cases tested. The general condition of the patient, and the stage and severity of the disease have great influence on the agglutination. The reaction can also vary during the course of the disease. In five far-advanced cases, four fail to react, while in thirty-eight patients which included healed, incipient, and advanced cases, five failed to react. In giving percentages, therefore, it seems fair to exclude the far-advanced cases, in which the diagnosis is plain without other means of help.

The chief reason for the difference in the results rests with the test culture used. In spite of the clear directions given by Arloing and Courmont, the preparation of the culture is extremely difficult, and it is very hard to have always on hand a culture at standard strength. In order to avoid this difficulty, Koch and Romberg have modified the method of Arloing and Courmont, and used emulsions of dead bacilli instead of living homogeneous cultures. These emulsions are much more easily prepared, and the results are much more uniform.

¹ From the Saranac Lake Laboratory.

In the following tests the "A" homogeneous culture of Arloing and Courmont was the one used. It was kindly given by Dr. Paul Courmont during his recent visit to America. The tests were all made with cultures which were standardized as accurately as possible. Where there was any doubt that the culture was at standard strength the test was not counted.

The culture was grown in the following medium:

Peptone (Witte	20
Sodium chloride	10
Glycerin	40
Water	1000

This was neutralized with normal soda solution. This is the formula given by Dr. Paul Courmont, with the exception that Witte's peptone was used instead of Dufresne's (French peptone). The standard serum was obtained from a normal sheep, whose serum was found to constantly agglutinate at 1-25. Clear fresh human serum was used to make the tests. It was obtained either from the lobe of the ear or from a vein in the arm.

With each serum, mixtures of different strengths were prepared at 1 to 5, 1 to 10, 1 to 15, and so on; that is, to one drop of serum five drops of culture are added, etc. Or, else, it was done by adding to—

.2 of serum	.8 of culture (1-5)
.1 of serum	.9 of culture (1-10)
.06 of serum	.94 of culture (1-15) etc.
.04 of serum	.96 of culture (1-25)

Comparative tests were made with these methods, and as they were the same, the latter one was used. The former, however, is simpler, and can be used with better advantage when one has a small amount of serum.

When agglutination took place in a dilution of 1 to 5, the reaction was considered positive. The time limit given to the reaction was five hours,—not more. A well-developed, actively growing culture of a month's growth was removed from the incubator and placed in the ice chest. It was used for a month, or as long as it was agglutinated by the standard serum up to the proper dilution. The necessary quantities of culture were taken and diluted with normal salt solution (0.8 per cent.) until the mixture became slightly milky.

Agglutination was observed by the naked eye up to five hours. Results were considered positive only in those tubes which showed well-marked flocculi easily visible to the eye, and with subsequent sedimentation and clearing.

Results.—One hundred and twenty-four serums were tested. I found later, however, that the culture was not at standard strength in sixty-two of these, and they were excluded. Sixty-two, therefore, remain to be reported on.

Of these 62 cases, 43 were tuberculous, 12 were apparently in robust health, and 7 were more or less suspicious as having tuberculous disease. In these 7 there was no positive evi-

dence of tuberculosis, and they were not tested with tuberculin. Of the 43 tuberculous cases 34 reacted and 9 failed; of the 12 healthy cases, 9 reacted and 3 failed; of the 7 suspicious cases, 7 reacted and none failed.

Of the tuberculous cases there were, 2 healed patients; 1 reacted and 1 failed; 3 patients that reacted to the tuberculin test, 3 reacted; 9 incipient cases, 8 reacted and 1 failed; 24 advanced cases, 21 reacted and 3 failed; 5 far advanced cases, 1 reacted and 4 failed.

It is thus seen that nearly all the more favorable cases gave positive reaction (i.e., 86.8 per cent.), and that only one of 5 far advanced cases reacted.

The average agglutinating power of the tuberculous serums that reacted was 1 to 10, whereas the average agglutinating power of the healthy serums that reacted was 1 to 23.

Conclusions.—1. In far advanced cases with very extensive or virulent lesions the serum reaction is generally absent.

2. The reaction seems to appear most often with the most favorable cases.

3. A certain number of favorable cases with well-marked signs of disease fail to show any agglutination.

4. Nine out of 12 persons in robust health reacted to the test. Six of the 9 were in close contact with tuberculous patients.

5. In the tuberculous cases the average agglutinating power was 1 to 10; in the healthy cases the average agglutinating power was 1 to 23.

6. Up to the present time I do not rely on the serum test as being a sure and reliable one for the presence or absence of clinical tuberculosis.

MEDICAL PROGRESS.

SURGERY.

Scopolamine-Morphine Anesthesia.—M. G. SEELIG (*St. Louis Med. Rev.*, Aug. 12, 1905) reports a series of sixty-five cases in which general anesthesia was preceded by the administration of scopolamine hydrobromate, grain 1-100, and morphine, grain 1-6, hypodermically. The general anesthesia was induced by means of the ethyl chloride-ether sequence. The series included the following range of cases: Abdominal hysterectomy, 8; vaginal hysterectomy, 6; hernia, 5; plastic operations, 8; operations on the tubes and ovaries, 11; uterine fixations, 6; curettements, 3; fistula in ano, 2; thyroidectomy, craniectomy, orchidectomy, appendicectomy, nephropexy, tumor of the breast, cyst of neck, pelvic abscess, exploratory laparotomy, one each. The author claims that as a result of his experience with this method, that he has never seen such good results with other methods. Of these sixty-five cases only one patient vomited or retched while on the operating table. Seventy-seven per cent. of the patients did not vomit at all. One-third of the patients that did vomit, did so only once, and then only from two drams to one ounce of clear mucous. Nausea was never pronounced, except in two cases, and vomiting never occurred earlier than two hours after the operation. The quantity of anesthetic necessary was markedly lessened. After the administration of scopolamine-morphine the patients are in a peace-

ful state of mind, and go under the influence of the general anesthetic without passing through the usual state of excitement. Salivation is almost invariably absent, thus adding another safeguard against aspiration pneumonia. After their return to bed the patients lie absolutely quiet and awaken without the slightest excitation. The first twenty-four hours following the operation is attended by much less pain and discomfort than in cases where the scopolamine is not administered.

Parietal Motor Nerves in Abdominal Section.—The apparent lack of attention that is paid by the majority of operators to the trunks or distribution of nerves supplying the abdominal region is commented upon by V. P. BLAIR (*Interstate Med. Jour.*, August, 1905) who carefully considers the subject and who gives the best methods of incisions so as to avoid cutting these nerve supplies. The author states that in the severance of motor nerves of the abdominal wall, that large areas of the abdominal parietes are deprived of their contractile power, thus causing the unparalyzed portions to bring about compensation by extra effort. When this compensation is defective there will be a tax on the involuntary muscles, which, if too great, will result in exhaustion, imperfect function and neurosis. All motor nerves and their distributions should be carefully considered in making abdominal incisions. The least harmful is that made in the median line and in the line semilunares. In other incisions, especially when they have to be lengthened, the author lays great stress upon the fact that they should be enlarged by tearing by means of hooks on the fingers and not cut.

Ligature of the Innominate Artery.—In reporting a case of aneurism of the innominate successfully treated by ligaturing WILLIAM SHEEN (*Annal. of Surg.*, July, 1905) thoroughly reviews the subject. Seven times only has this operation been successful. The author's operation was as follows: Median incision from cricoid to one inch below sternal notch; the carotid and innominate exposed and freed; then a double floss silk ligature carried around the innominate distally and tied with Balance's "stay knot." Pulsation ceased, but later reappeared. A second similar operation also failed. The third operation was performed through a five-inch transverse incision above the clavicle. The artery was ligated twice proximally. Recovery uneventful. Abstracts of previous recorded cases are given. In 36 cases ligature has been accomplished; mortality 78 per cent. Of fatal cases 24 were due to sepsis and hemorrhage combined; 3 to sepsis alone; 3 to cerebral lesions; 1 to acute pericarditis; 1 to pus kidney and 1 to bronchopneumonia. Of recoveries only one occurred during the preantiseptic period. Conclusions drawn are: (1) in properly selected cases the operation is reasonably safe; (2) suitable cases are those of the globular and circumscribed variety; (3) the maintenance of asepsis is the chief factor for success; (4) the incision should be central with horizontal and vertical division of the manubrium, if necessary; (5) the carotid be tied also; (6) the ligature should be silk; (7) some injury of the inner coats is probably necessary to insure occlusion; (8) two ligatures, if possible, be placed; (9) drainage is inadvisable; (10) cerebral lesions stand next to sepsis as cause of death; (11) "Valsalvan" methods prior to operation are inadvisable.

Surgical Treatment of Colitis.—Following some preliminary remarks upon the classification of colitis and the physiology of the appendix and cecum J. E. SUMMERS, JR., says (*Annal. of Surg.*, July, 1905) physiologists are beginning to recognize the necessarily im-

portant part the appendix, cecum, and ascending colon take in digestion. The end of the day seems to be that the whole colon is simply a sewer canal, but its importance in digestion is proven by its glandular structure. Any interference of function reacts, producing either appendicitis or colitis. An interesting and important topic is the observation by means of the X-rays and bismuth impregnated food that antiperistalsis is a constant factor in the digestive process of the large intestine. This admits of thorough mixing and absorption of the contents. Also experiments on the disposition of nutrient enemata, similarly conducted, demonstrated that these were ultimately carried to the cecum, absorption taking place chiefly above the descending colon. Anything which disturbs the antiperistalsis is apt to induce an inflammation of the colon. Surgically, colitis is divided into three classes; primary bacterial, secondary bacterial, and that induced by mechanical interference. Upon these causes hinges the surgical treatment, and if carried out intelligently, will be successful. It will not do to confine all cases to a right inguinal colostomy. This was first selected for bacteriological cases, but even here Gibson's operation has many advantages. In the appendicular forms of colitis removal of the appendix is all that is required in the explosive form. Whereas in the neurasthenic type of Deaver not only should the appendix be removed, but Gibson's fistula ought to be established. If this does not produce a return to health then some operation for exclusion must be done.

Thyroidectomy for Exophthalmic Goiter.—In a contribution comparing the surgical treatment of exophthalmic goiter, F. HARTLEY (*Annal. of Surg.*, July, 1905) reports 15 cases of partial thyroidectomy with 93.4 per cent. cures. In the literature there are five instances where symptoms have returned after operation. Tetany and sudden death have been known to occur during or just after operation. Medicinal treatment should precede surgical interference, because of undoubted cures, but should not be continued too long, since the disease tends to diminish the vital resistance and exhaust the nerve centers. Early operation is indicated in all cases as soon as medicinal treatment fails, and especially so where the disease is engrafted upon colloid goiter. The anesthetic used in this series was ether or gas and ether. The extirpation of the greater part of the growing gland is made in all cases. The method employed was Kocher's. Fourteen of these patients seen postoperatively are in good health; anxiety, nervousness and muscular tremor all gone, and in all but three cases the exophthalmos has disappeared. One patient died during operation; mortality, 6.6 per cent. Partial thyroidectomy is compared with sympathectomy; statistics given. Results are shown to be about equal, but with the advantage in favor of thyroidectomy, both as regards mortality and cures.

Tuberculous Lymph-Nodes.—The surgical treatment of tuberculous lymph-nodes, with a study of one hundred cases, is presented (*Annal. of Surg.*, July, 1905) by CHARLES N. DOWD. Three generalizations are important. (1) The disease is serious. (2) Thorough extirpation is better than partial removal or palliative measures. In 692 cases treated constitutionally, 29.2 per cent. later developed tuberculosis in other parts. (3) The prognosis is better in children than in adults. The disease usually begins insidiously. A majority of the patients live in unsanitary surroundings. The throat is the most common portal of infection. There is abundant evi-

dence that the bacilli can go through mucous membrane and infect lymphatics without leaving visible evidence of their transit. The diagnosis is not always easy. Syphilitic enlargement and simple hyperplasia often offer difficulties. The anatomical arrangement is considered with drawings. The operation is described under the following headings: (1) Incisions. (2) Structures to be removed and avoided. (3) Details as to time and wound treatment. The incisions are important. Disfiguring scars are and usually can be avoided. Longitudinal scars stretch and frequently thicken. Transverse scars following the neck-creases do not stretch, and after a short time are almost invisible. Description of incisions and accessible glands are given: The nodes are to be removed with as little surrounding tissue as possible. Structures to be avoided are the internal jugular vein, the spinal accessory nerve, and the lower fibers of the facial nerve. It is not often necessary to divide the sternomastoid muscle. Injury of the thoracic duct has been recorded. Plenty of time should be given to the operation, but it should not be unduly prolonged. For a child under twelve years it is seldom wise to continue longer than one hour at a time. Irrigation is desirable, and as a routine drainage is advised. The dressings should be bulky and changed daily. In this series there was no mortality; freedom from recurrence in 75 per cent., and ultimate recovery in 90 per cent. of the cases.

X-Ray in Malignant Disease.—W. B. COLEY, basing his observations upon the result of over three years' tireless investigation, discusses (*Annal. of Surg.*, August, 1905) the value of the X-ray in the treatment of cancer, including sarcoma. During the time specified 176 patients were treated, as follows: 68 cases of sarcoma; 36 of carcinoma of the breast; 44 of epithelioma of the head, face and neck, including tongue; 14 of deep-seated abdominal growths, probably carcinoma; 5 not classified; 3 of tuberculous glands of the neck; 3 of Hodgkin's disease; 3 of lupus. In five cases of sarcoma there was complete disappearance of the growth, but in all it recurred a few months later. In two of these the recurrent growth disappeared under combined X-ray and toxin treatment, the patients remaining well to date. The 36 cases of carcinoma of the breast furnished nearly every variety of this disease. The treatment was almost wholly negative. In only one patient did the tumor disappear, and in this case the diagnosis was in doubt. Of the 44 cases of epithelioma of the head, face and neck, in only four did the disease disappear entirely. In every case in which there was glandular involvement, no improvement whatever was noticed, and the rays had little, if any, effect in retarding the disease. One patient suffering with Hodgkin's disease improved markedly at first, but later died suddenly. No autopsy. There was complete disappearance of lupus in two patients, and improvement in the third. In one patient tuberculous glands of the neck decreased in size; in one they disappeared, and in the third there was slight involvement. Reports from several other series of observations agree fully with this. Of late the X-ray as a preoperative measure has been advocated, the reason given being that the operative field is thus cleared. The fallacy of such reasoning is twofold: (1) It presupposes that the agent is curative, and (2) it takes for granted that no harm can come to the patient by reason of delay. Both of these arguments are pernicious.

PATHOLOGY AND BACTERIOLOGY.

Laryngeal Diphtheria Complicating Cerebrospinal Meningitis.—W. K. SIMPSON (*Med. Rec.*, Sept. 16, 1905) reports this case to demonstrate that cerebrospinal meningitis and true diphtheria may co-exist in the same patient, and that the respective germs are not necessarily antagonistic. The patient, a married woman, aged twenty-seven years, was taken down with a classical attack of cerebrospinal meningitis. Twenty-one days later and while in the midst of her cerebrospinal symptoms she gave evidence of hoarseness, a croupy cough, and beginning laryngeal dyspnea. Examination of the larynx revealed the entire lumen filled with a distinct thick membrane. Intubation became necessary and subsequently large pieces of membrane were expelled through the tube, from which a pure culture of the Klebs-Löffler bacillus was obtained, confirming the diagnosis. During a period of nine days 30,000 units of antitoxin was administered, and since this case occurred at the time when the use of antidiphtheria serum was being advocated in the treatment of cerebrospinal meningitis, the effect was carefully noted. No appreciable influence was observed upon the course of the meningitis. Once during and twice after the period of serum treatment, lumbar puncture was performed, and in each instance there was found the characteristic *Meningococcus intracellularis*. It is possible to suppose that if diphtheritic antitoxin was in any way antagonistic to cerebrospinal meningitis its administration would show effect in the destruction of these cocci.

The Trichocephalus in Typhoid Fever.—Following up the observations of Gujart, GIUSEPPE SPIZZA reports (*Med. Rec.*, Sept. 16, 1905) nineteen cases of typhoid fever, in seventeen of which the eggs of the *Trichocephalus* were noted in the stools. The presence of the eggs seemed to have no special relation to the day of the disease or to the physical character of the feces. In other diseases, especially of the gastro-intestinal tract, these eggs are rarely seen. These observations lead to the conclusion that this intestinal parasite, from its ability to wound the intestinal mucosa, plays an important rôle as a predisposing etiological factor to typhoid infection. That the development of the *Trichocephalus* is not a natural consequence of this disease is disproved by the fact that the growth of the parasite from the egg in the stomach to its adult stage covers a month and more; whereas the eggs are found in typhoid stools during the first few days.

Etiology of Syphilis.—In order to become acquainted with the appearance of the *Cylindrocapsa*, J. SEGEL (*Münch. med. Woch.*, July 11, 1905) states that it is absolutely necessary to become familiar first with the artefacts which are liable to be found in normal blood. If a drop of normal blood be examined under a cover-glass with a high power, small, movable granules and filaments will soon separate out owing to the breaking down of the cells. In syphilis the structures have a more definite shape and size, and are much more refractile. The more characteristic forms are distinctly flattened and pear-shaped and possess a rapid, jerky motion owing to the presence of flagella. This motion will at once cease if a small amount of chloral hydrate is added to the blood. On permitting the blood to dry out under the cover-glass, a distinct nucleus with 2 to 16 refractile granules will be evident. The organisms are most numerous in

the blood during the second and third week of the disease, and are particularly abundant in the secretion of the primary sore. The staining is rather difficult, but the nuclei are brought out well by a combination of hematoxylin and azur, while the flagellæ are rendered prominent by the older method of Giemsa for plasmodia. Proof that the organisms stand in definite relation to syphilis is to be found in the fact that they occur in large numbers in the blood of apes which have been inoculated with syphilitic virus. Some further notes on the *Spirochæta pallida* are to be found in an article by C. THESING (*Münch. med. Woch.*, July 11, 1905). This author denies all etiological relation, and states that in many cases the spirilla are not derived from the interior of the lesions, but from the surface of the skin or from the stain, which harbors many organisms unless boiled shortly before use. Structures corresponding in every way to the organisms described by Schaudinn and Hoffmann were also found in the smegma of absolutely healthy individuals.

Blood-Pressure Observations for the Practising Physician.—CLINTON E. BRUSH (*Am. Med.*, July 15, 1905) speaks of the importance of using a cuff at least 12 cm. wide, as the error in cuffs that wide or wider may be disregarded. The importance of obtaining both diastolic and systolic pressures is emphasized—the method of Strassburger for determining diastolic pressures being deemed sufficiently accurate for ordinary work. He concludes (1) both systolic and diastolic pressures should be taken. (2) The cuff on the instrument should be at least 12 cm. wide. (3) With the wide cuff the normal systolic blood-pressure for the healthy adult male is nearer 110 mm. Hg. than it is 130 mm. Hg. (4) The chief value of blood-pressure observations lies in the lead they give in regard to indications for and results of treatment. (5) In a few conditions they are of diagnostic value. (6) In many conditions blood-pressure observations are of no practical value.

Pathogenesis of Myelogenous Leucemia.—Myelogenous leucemia is characterized by A. JOUSSER (*Arch. de Méd. Exper.*, July, 1905) as a chronic septicemia, whose infective agent causes definitive lesions in the hemopoietic organs, lesions which survive the infection and which imprint their special seal upon the syndrome. The author has isolated a number of germs in this condition, but does not believe that they are specific. What is really specific is the mode of reaction of the tissues.

Effect of Experimental Cholemia in the Cardiac Ganglia.—It is well known that bradycardia frequently results from icterus; the question presented itself to R. MALATESTA (*Arch. de Méd. Exper.*, July, 1905) whether this condition might not be due to pathological changes in the cardiac ganglia. With the object of deciding this question he experimented in rabbits, producing an icterus by means of ligation of the common duct. Examination of the cardiac ganglia revealed a peripheral chromatolysis, which gradually extended throughout the entire cell body, a coloration of the achromatic substance, a vacuolization of the cell-body and a production of a homogeneous condition of the nucleus. In some cases the cardiac ganglia are not affected. The author does not believe that the bradycardia is due to the pathological changes in the ganglia. These changes are found likewise in other parts of the nervous system, and so far as they affect the cardiac ganglia, they are not severe. Similar changes have

been found in intoxications that result in a rapid pulse.

Bacteriology of Bronchitis.—The sputum of bronchitis, secondary to heart disease or emphysema, has never been found absolutely sterile by J. KARCHER (*Deutsch. Arch. f. klin. Med.*, Vol. 81, Nos. 3 and 4), but as a rule the germs present were scant in number and of diminished vitality. Streptococci and staphylococci were most numerous, less often pneumococci were encountered. In acute and subacute processes, the bacteria were more abundant, but as a rule the same varieties predominated.

Influence of the Roentgen Rays on Leucemia.—In order to study the effects of the Roentgen rays on leucemia, J. LOSSEN and P. MORAWITZ (*Deutsch. Arch. f. klin. Med.*, Vol. 83, Nos. 3 and 4) studied the blood, urine and wherever possible the organs. Thus in a case of myelogenous leucemia the leucocytes had returned to the normal number and the excess of uric acid in the urine disappeared, so that the white cells were probably formed less abundantly in the hematopoietic organs. In other cases, however, where an extreme leucopenia resulted, the percentage of uric acid remained unaltered. Under the influence of the X-rays the proportion of the different forms of leucocytes may return to the normal or, on the other hand, an aplastic leucyemia may result. The organs very often show a decided hypoplasia.

Pathogenesis of Icterus.—S. ABRAHAMOW (*Virchow's Archiv*, Vol. 181, No. 2) has applied special staining methods which have enabled him to trace the course of the finer bile capillaries in the liver in various pathological processes accompanied with jaundice. Normally, the epithelium of the capillaries is soon replaced by a mere cuticle border. The capillary itself courses in the axis of the acinus and constantly anastomoses with neighboring capillaries. Small branches are given off throughout the entire interacinous course, which enter the cells and often end blindly near the nucleus. Wherever the flow of the bile is impeded owing to the presence of a stone or a tumor involving the biliary ducts, extreme dilatation of these blind ends will occur so that they extend to the vascular border of the cell. Eventually rupture takes place, so that the bile has free access to the perivascular, lymphatic spaces. It has been found, however, that an obstructive jaundice is also possible if the thoracic duct is ligated; this is explained by the fact that the dilated capillaries will exert pressure upon the accompanying blood vessels and erode their walls. The icterus of cirrhosis of the liver is due to compression of the finer bile-capillaries by connective tissue while the icterus of heart disease is partly explained by connective tissue, partly by the formation of thrombi of inspissated bile, which impede the flow downward. In destructive processes in the liver, such as accompany tumors, it is evident that the walls of the bile-capillaries may be eroded and that the bile may find free access to the perivascular spaces. Lastly, jaundice may be a symptom of pure functional disturbance of the liver, as in infectious diseases and in icterus neonatorum. In these cases it is likely that the cells themselves are at fault and that there is an increased production of bile with possibly a diminished pressure in the capillaries.

Staining Leucocytes in the Counting Chamber.—In order to obviate the examination of smears to obtain a differential leucocyte count, W. RAMER (*Münch. med. Woch.*, Aug. 1, 1905) employs the

following solutions: (1) Methylene blue, 0.05; formalin, 1.0; distilled water, 100.0, to which are added three drops of formalin. (2) Eosin, 0.05; formalin, 1.0; distilled water, 100.0. The first solution is sucked up five times to the mark 1 of the pipette and once to the mark 0.5, then blown into a clean glass dish. The blood is then sucked into the pipette up to the desired height, then diluted with the above amount of methylene blue solution, and finally with the eosin solution up to the mark 101. By allowing the first solution to act before the second, a satisfactory staining of all the elements in the blood will always be obtained.

EYE, EAR, NOSE AND THROAT.

Voluntary Iris.—J. W. SHERER, *Journal A. M. A.*, May 6, 1905) reports a case of this rather rare condition. It was first noticed at the age of nine, when the child developed the power of voluntary rotating the eyeballs independently. After that it became a matter of common observation that the iris could be dilated at will, almost to the disappearing point. At puberty the right iris was for awhile twice the size of the other, but later they became equal again. The power to stimulate convergent strabismus is possessed by the woman to a remarkable degree. Vigorous exercise of the iris movements seem to cause slight aching of the eyes, but no other inconvenient symptoms are reported.

Cause of Progressive Myopia.—Myopia is a result of deficiency of the posterior half of the sclerotic generally due to absence or poor development of the elastic fibers, which normally are very abundant. The lateral pressure, exerted by the external muscles of the eye, will cause a bulging of the posterior pole, as a result of which the sagittal axis will become longer. The thickness of the sclerotic is also of importance, since a thin layer will hasten, a thick one retard, the process. The stretching of the sclerotic at the posterior pole will also cause tension of the internal tunics, hence diminished visual acuity. This tension may, however, be also due to deficiency of the circular portion of the ciliary muscle. In this case, the longitudinal fibers will cause tension during accommodation. According to G. SEGGERL (*Münch. med. Woch.*, May 2, 1905) all three defects (absence of elastic fibers, thin sclerotic, deficiency of circular muscle fibers) are congenital and inherited, and all three, or the first and second, are responsible for progressive myopia. Proper glasses will not prevent, but may inhibit, the process.

Importance of Lumbar Puncture in Ear Complications.—Before the popularization of lumbar punctures, there has often been considerable doubt in the minds of ear specialists whether in the presence of certain symptoms an operation was indicated or whether a meningitis was already present. C. GRÜNZERT (*Münch. med. Woch.*, June 20, 1905) states that it is the duty of all ear specialists to familiarize themselves perfectly with the simple technic of withdrawing lumbar fluid. A clear fluid, evacuated drop by drop, will argue directly against a meningitis and may urgently demand an operation since the symptoms may be due to a brain abscess or other circumscribed suppuration, and the patient may thus be saved. On the other hand, a turbidity, even if very slight, almost always means the death warrant for the patient; since, however, a few cases have been known to recover, it is always best to identify the bacteria present. Streptococci and tubercle bacilli are always more serious than pneumococci.

Since the bacteria often stain poorly in the fluid, it is best to employ the dyes for at least half an hour. Occasionally it may be necessary to resort to culture methods or to inject animals. The only bad after-effects ever observed are due to hemorrhage and to the sudden fall of intracerebral pressure. As a rule they are not severe and rapidly disappear.

Traumatic Lesions of the Eye.—F. W. MILLER (*Journal A. M. A.*, Aug. 5) remarks on the various possible traumatic injuries of the eye and their causes, and the necessary classification into recent and old cases, according to whether they are seen before or after the exudates of plastic lymph during the first few hours. The chief danger in these cases, he states, is infection, though hemorrhage is often troublesome and may be very destructive. In non-penetrating and recent cases only can an expectant attitude be assumed. Every penetrating wound must be considered as probably infected and treated as such, so far as possible. The vigorous measures used in general surgery are unfortunately not all applicable to the delicate structures of the eye. Miller speaks very highly of the subconjunctival use of cyanide of mercury, according to Darier's suggestion, in these cases. It should be used early, and not merely as a last resort. Another remedy which he considers exceedingly valuable is dionin, not only for its analgesic properties, but also for its ability to clear up exudates and opacities. Individual treatment and conservatism are necessary as a rule. The question of enucleation arises in severe injuries, and great care and judgment should be used in its decision, especially in case of children whose orbital development may be affected. In case of burns, special effort should be made to prevent disastrous cicatrices and adhesions. In all doubtful cases consultations are desirable and prognosis must always be most guarded.

PRESCRIPTION HINTS.

Non-Operative Treatment of Nevus.—NEUMANN (*Deutsche med. Woch.*, No. 20, 1905) uses an emulsion of pure and dried chloride of zinc (5 to 10 per cent.) in elastic collodion. This is painted with a camel's-hair brush over the nevus, the surrounding skin being protected by strapping. When the collodion is dry, a bandage is applied, which remains on for eight days. The scab is then found to be shed. Any remains of the nevus are covered with gauze, on which has been spread the following ointment:

R Acidi Arsenici..... } aa ʒi
Sulphur depur..... }
Ung. ceræe ʒiii

This is kept on for three days and the necrosed tissues scraped away with a sharp spoon. This is repeated until the nevus has disappeared.

Nervous and Reflex Vomiting.

R Bismuthi subnit..... ʒi
Cerii Oxalat..... ʒss
Glycerit ac. carbol. (1-4)..... ʒxx
Ips. chloroformi } aa..... f ʒi ss
Tinct. cardamom. comp. }
Aquæ menthae pip..... f ʒiv
Aquæ calcis..... q. s. ad f ʒii

M. Sig. Teaspoonful in a tablespoonful of water every hour till relieved. (Reed.)

Acute Otitis Media.

R Stovaine..... gr. iii
Resorcin gr. ii
Glycerin ʒii

M. et Sig. Pour seven or eight drops into the ear every two hours. (G. Laurens.)

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THE STUDENT LIFE.

To stand upon a mountain above the plain of life and to see one's possessions narrow toward the vanishing point of human perspective makes a philosopher of the meanest of us. And the more often we mount above our daily level the more clearly do we see our relations to our fellow men and theirs to each other. The man who knows these sensations of clear vision and secure wisdom which sweep over him when he sees the world of river and plain as it really lies, will perceive an analogous pleasure in standing for a moment with Dr. Osler as he takes a last look at his once familiar surroundings in Canada and the United States.

In reading his farewell address to Canadian and American medical students, printed in this issue of the MEDICAL NEWS, we feel a thrill of comprehension as he points out one by one the various kinds of lives that lie before the medical profession, and outlines the possibilities of extending the boundaries of one's narrow lot by study. What has already been done lies clearly mapped out at our feet, and as he points to the type of student that has blazed the path and laid the first foundations in the crude soil, we are tempted to think that there is no undiscovered country for the genius to open up. But so fa-

miliar is he with the mountain-top, so keenly observant of the march of affairs, that when he indicates in what direction the newest developments lie we are eager to follow his guidance.

It is to the country practitioner that Dr. Osler draws attention. The small town and the country-side has sent its best men to the city, hoping often in vain for their return. And when they have come back their enthusiasm has not been able to stand the strain of the years of waiting. With the student habits which he advises, with the books and laboratories which it is possible to possess even with a limited income, and with the fervent spirit of inquiring, studying and testing every case that comes along, the young practitioners in small towns and country places could, in the course of a generation, change the whole face of medicine in the country.

THE ETIOLOGY OF YELLOW FEVER.

The recent publication of a "preliminary report on cells found in yellow fever blood, with reference to their etiologic and diagnostic significance," by Drs. Pothier, Hume, Watson and Couret, of New Orleans (*Journ. Am. Med. Assoc.*, Sept. 23, 1905), calls for more than passing comment in view particularly of the wide publicity accorded the report by the activities of the Associated Press.

The belief that the cause of yellow fever has definitely been hunted to the ground, fostered by the specific assertions of the press notices, rests as yet on very insecure foundations.

In the report alluded to the authors state that a careful study of the blood of patients with yellow fever shows certain cells, heretofore undescribed, which undergo developmental changes and which can further be demonstrated in the stomach of a recently infected *Stegomyia*. These parasites are described as extracellular, groups in twos or more, approaching in size from twice the diameter of a pneumococcus to one-fourth the diameter of a red blood cell. They are ovoidal or spherical in shape and are composed of a highly neutrophile granular protoplasm with one or more chromatin staining nuclear masses. A capsule is observed particularly in what are assumed to be older forms. The authors describe four types varying in some minor technical details as to shape, size and staining qualities.

Since the classical filtration experiments of Reed and Carroll (*Am. Med.*, Feb. 22, 1902)

there is little escape from the conviction that the blood in yellow fever contains an infectious parasite which can pass through a Berkefeld filter capable of holding back the minute *Staphylococcus aureus*. This does not a priori negative our present findings, however, since it may be possible that the newly described organisms may in some stages of their growth be sufficiently small to pass through. Certainly the comparatively large organism described could not pass through the filter test as devised by Reed and Carroll.

It may be recalled that in the report of Working Party Number 1 of the Yellow Fever Institute, Drs. Pothier, Parker and Beyer (Yellow Fever Institute *Bulletin* No. 13, March, 1903) claimed to have found a minute body, which they termed the *Myxococcidium stegomyia*, and which was held by them to stand in etiological relationship to the disease, having been found in the blood and in the stomach of the *Stegomyia*. We cannot escape the conviction that the present discovery is a rehabilitation of the claims of one of the members of this working party at least, although this preliminary report does not make any specific mention of the *Myxococcidium*. The description of the organisms is very similar, however.

The claims regarding the *Myxococcidium* have been fairly well sifted and found wanting, both by Working Party Number 2 and by the French Commission headed by Marchoux (*Bulletin* 14, Yellow Fever Institute, 1905, and *Ann. de L'Inst. Pasteur*, Nov., 1903). Both of these groups of investigators found the bodies described, but they were practically unanimous in showing that so far as the organism in the mosquito body was concerned the *Myxococcidium* was probably a commensal yeast, the *Saccharomyces apiculatus*, a very common growth in many mosquitoes. Further, if Schaudinn's suggestion is correct (*Arb. a. d. k. Gesundheitsamte*, 1904), that the inflammation of mosquito bite is largely due to the development of these same yeasts in the human skin it is not impossible that the *Saccharomyces apiculatus* may be the organism recently described as the etiological factor. Certainly the description as recorded by Drs. Pothier, Hume, Watson and Couret are remarkably like those of certain forms of wild yeast.

When the further evidence is borne in mind that scores of investigators have studied the blood smears by modern technical methods, it

does not seem probable that so potent an organism as the one described would have slipped by unnoted. We prefer to reserve our judgment and wait for confirmation of the recent findings.

"TIT TAT TO."

CALIFORNIA is certainly one of the most prolific states in the Union. Exuberant in her growths and redundant in her productions it is hardly to be wondered at that lavish nature should at times overstep the bounds of conventional habit and become forgetful of her accustomed limitations.

This is all the more natural when we remember that even in the effete East she is at times guilty of a playful hyperplasia that is evinced by the production of the race of double-toed cats which is indigenous to the stern and rock-bound coast of New England, while the appearance of an occasional and superfluously extra finger on the infantile hand of the far North is an event that demands little more than the registration of the fact in the local news of the country paper.

Remembering these facts, therefore, we are not surprised by the announcement in the columns of the *Oakland Clarion* that Miss Isabelle Lefevre, of 661 Madison Street, Oakland, Cal., is the proud and undisputed possessor of three tonsils. Whether she was born with them, whether she achieved them, or whether they were thrust on her, the report does not state. As three of a kind, however, are better than a pair, particularly in California, the late Mr. Jack Hamlin, or Mr. John Oakhurst, would probably claim that she obtained them in the "draw." The fact, however, remains, according to the story of our esteemed lay contemporary, that Miss Lefevre has reached the age of fifteen years and that she not only still holds them, but that their possession has caused her to become a "stand-patter" of the most uncompromising type.

The indictment against Miss Isabelle, which is brief, is as follows: "Miss Lefevre has three tonsils; she stays out nights with undesirable companions. She is wayward in practice and will not go to school." As to the number of tonsils, we are, as we say, with certain reservations, willing to accept it, but we do not quite see the connection between the third tonsil and the habit of nocturnal ramblings with undesirable companions, nor do we know what the standard of desirability of "gentlemen friends" for girls

of fifteen years to "stay out nights" with is. Whether the good people of this California resort gauge it by age, sex or previous condition does not appear in the report, and there is no mention of the time at which Miss Lefevre was accustomed to return. It seems evident, however, that curfew does not ring at Oakland.

As to the third and last count, that she is wayward in practice and will not go to school, the charge is luckily more explicit, for were it not for this it might have been easily imagined that she was merely a truant bird who thought her home a cage, while it is in the evidence that Judge Hall had, because of her behavior, seen fit to put her under the care of the probation officer. Meanwhile Miss Helen Swett, one of the vice-presidents of the Associated Charities, imbued with the idea that practice might prove more efficacious than preaching, took the girl to one Dr. Louise M. Tenny, who found that "she was suffering from an adenoid growth or third tonsil at the upper end of the pharyngeal cavity behind the palate." This the good doctor has "watched most carefully," and is now convinced that the patient's waywardness is due to the abnormal growth in the throat. For, it is explained, "the third tonsil hinders the flow of blood to the brain. In this view starvation of the brain affects moral responsibility, and the observance of the Ten Commandments depends in large measure on this physical condition."

And it is right here that we draw the line. We can readily understand that a girl who is wayward in practice and who has a penchant for "staying out nights" with questionable companions might easily break one of the Ten Commandments. Nay, we will go even farther, and if Dr. Tenny is such an insatiate archer that one would not suffice, we must admit for the sake of argument that she might knock the corners off of even another, but that the adenoid would cause a total disregard for the observance of the entire *ten* seems to us to be stretching the matter of tonsils a little too far.

As, however, Dr. Tenny seems possessed of some of the earmarks of an authority on the subject, it may be that the tonsil of the West differs in magnitude from the tonsil of the East. All flesh is not the same flesh, and the glory of the California adenoid may be terrestrial and sown in corruption. For Dr. Tenny explains that its removal almost invariably has an extraordinary influence on the mentality and morals of

those on whom the operation is made. Children with vicious, wayward tendencies, on recovering from it, frequently show an entirely different and much improved disposition. "The reason for this," she thinks, "is more physiological than psychological. It removes a drain on the vitality; it eases and destroys what has always been a source of irritation. The brain, as well as the whole system, is, of course, better nourished as a result of the removal of the abnormal growth."

All this seems reasonable when applied to a large tumor, or to one that is exerting pressure, but that an extra tonsil in the pharynx will give rise to reflex action in the brain sufficient to cause a patient to run amuck with the whole series of the Commandments seems to be of the nature of a very tall oak grown from a very little acorn. Then, too, it is most easy to understand that any child of fifteen years would much prefer to take her doll clothes and "play" with companions of her own age, no matter how objectionable, than to be either mothered by the "probation officer" or fathered by Miss Swett or the Associated Charities. There is no evidence of total depravity in this, so that, taking one consideration with another, remembering the ordinary symptoms of adenoid trouble, and bearing in mind the enormities that this girl is charged with, we feel that we must look deeper for some more plausible etiology.

Far be it from us to question the professional acumen of a sister practitioner, or to cast aspersions on her diagnostic ability. But in view of the peculiar manifestations of this case, the indifference to the Mosaic law and the propensity to "stay out nights," is it not possible that when the case was presented to Dr. Tenny, that the gentle Louise touched the harp lightly on the absence of some inward spiritual grace, while she bore, with an all too heavy hand, on the outward visible sign of the three little tonsils "all in a row?"

ECHOES AND NEWS.

NEW YORK.

The Herter Lectures.—The Herter Lectures, established by Dr. C. A. Herter at the New York University and Bellevue Hospital Medical College, will be given this year by Prof. Carl von Noorden, Chief of the City Hospital of Frankfurt-a. M., Germany. His subject will be Diabetes. The lectures, six in number, will be given in English in the large auditorium of the Carnegie Laboratory, 338 East Twenty-sixth Street, from Monday, October 9, to Saturday, October 14, inclusive, at 4 o'clock in the

afternoon. Visitors are welcome to these lectures. Reserved seats to be had on application to the college.

Convention of Homeopathic Medical Society.—The twenty-ninth semi-annual convention of the Homeopathic Medical Society of the State of New York opened at Syracuse, September 26, with a large attendance. A special committee made a report which favored action against "scare" advertisements, inducing persons to believe they suffer from disease, many of which the committee regarded as immoral. The matter of health qualifications for marriage was not taken up, Secretary H. Worthington Page, of New York, stating that it was impossible to get desirable legislation to the end sought, and nothing would be done.

A Weather Guessing Contest.—T. R. Fast, a lawyer, of this city, writes: "As an amateur farmer I am interested in the weather. I have gathered meteorological data for years, but as yet have not found the slightest basis on which to ascertain the state of the weather even twelve hours ahead. The Government weather predictions are very faulty; and as many laymen claim they can predict the weather more accurately than the weather bureau, without any of the elaborate apparatus of the Government, I hereby appeal to all the weather prophets of this country to enter a thirty-day contest for a cash prize of \$100, which I will give to whoever predicts the weather most accurately, and will tell for the benefit of the public by what methods he arrived at his conclusions.

Society of Sanitary Prophylaxis.—The program of the October meeting of the Society of Sanitary and Moral Prophylaxis will be as follows: (1) Should the youth of the country be educated in a knowledge of sexual physiology and hygiene? (2) What should be the nature and scope of this education? (3) At what age should this instruction be given, and should it be progressive according to the age of the individual? (4) Through what agencies should this instruction be given—through parents, physicians or teachers? Should our educational centers—high schools, colleges and universities—be utilized for this purpose? (5) Should the teaching of sexual physiology be incorporated in our textbooks of elementary hygiene? As the educational feature of the society's work is an important one, the Executive Committee would be glad to have a general expression of opinion from the medical profession as to the availability and practical value of this proposed education. Physicians who have given serious thought to the subject are invited to send to the Secretary their views upon any or all of the questions submitted for discussion. Such communications will be analyzed and tabulated and form the subject of a report by the Committee on Education.

Harvey Society.—This new society for the diffusion of the knowledge of the medical sciences offers the following as its first course of lectures for 1905-1906, which are to be given under the patronage of the New York Academy of Medicine: Oct. 7, Prof. Hans Meyer, "Die Theorie der Narcose" (in German); Oct. 14, Prof. Carl von Noorden, "Modern Problems of Metabolism;" Nov. 4, Prof. F. G. Novy, "Trypanosomes;" Nov. 18, Dr. P. A. Levene, "Autolysis;" Jan. 20, Prof. W. H. Park, "A Critical Study of Serum Therapy;" Jan. 27, Prof. Lewellys F. Barker, "The Neurones;" Feb. 2, Prof. F. S. Lee, "Fatigue;" Feb. 9, Prof. L. B. Mendel, "The Formation of Uric Acid;" Feb. 16, Prof. T. H. Mor-

gan, "The Extent and Limitations of the Power to Regenerate in Man and Other Vertebrates;" Feb. 23, Prof. Charles S. Minot, "On the Nature and Cause of Old Age;" March 2, Prof. J. C. Webster, "Modern Views Regarding Placentation;" March 9, Prof. Theobald Smith, "Some Phases of Tuberculosis;" March 16, Prof. W. H. Howell, "The Cause of the Heart-beat." The lectures will be held in the Academy of Medicine at half-past eight on the above Saturday evenings during the winter. In the Sorbonne at Paris courses of lectures by distinguished Frenchmen and men of other lands are given with the object of bringing science before those engaged in practice and art of various pursuits. The aim of the Harvey Society is similar in character. The Harvey Society invites all interested to attend this course. Dr. Graham Lusk is the President of the new society.

Conference of Sanitary Officers of the State of New York.—The fifth annual conference will be held in the Capitol at Albany, October 4 and 5, 1905. The following program has been arranged: Opening session, Wednesday, October 4, address of welcome by Hon. F. W. Higgins, Governor of the State of New York; address by Dr. Eugene H. Porter, State Commissioner of Health; address by Hon. Julius M. Mayer, Attorney General of the State of New York.

Evening session, October 4, "State Assistance in the Local and Institutional Control of Contagious Diseases," by Dr. F. F. Westbrook, Director Laboratory, State Board of Health, Minneapolis, Minn., President American Public Health Association. "Pathology of Diphtheria" (illustrated with lantern slides), by Dr. Richard M. Pearce, Director Bender Hygienic Laboratory, Albany, N. Y. Discussion.

October 5, morning session, "Statistical Studies of Pneumonia and Typhoid Fever," by Dr. John S. Fulton, Secretary, State Board of Health of Maryland, Baltimore, Md. "Status of Pneumonia and Cerebrospinal Meningitis as Contagious Diseases," by Dr. William H. Park, Director Bacteriological Laboratory, Department of Health, New York City. "Some Isolated Outbreaks of Cerebrospinal Meningitis in New York State," by H. D. Pease, Director of Antitoxin Laboratory, State Department of Health, Albany, N. Y. Discussion opened by Daniel Lewis, M.D. In the afternoon of October 5, at one o'clock, the guests and members of the conference will take a special train at the Union Station and proceed direct to the new sewage disposal plant of the village of Saratoga Springs, as guests of the State Department of Health. "The Pollution of Streams and the Natural Agencies of Purification" (illustrated), by Mr. George C. Whipple, New York City. "The Purification of Public Water Supplies" (illustrated), by Mr. Robert Spurr Weston, Boston, Mass. "Water Resources of this State Available for Potable Water Supplies," by Prof. O. H. Landreth, Consulting Engineer, State Department of Health. "Description of Methods for the Collection of Samples of Water for Chemical and for Bacteriological Analysis," by Dr. Willis G. Tucker and Dr. R. M. Pearce.

PHILADELPHIA.

Medical Ethics.—At a stated meeting of the Philadelphia County Medical Society, held June 21, 1905, a resolution was adopted conveying a request that all medical schools furnish their senior class with a special course of lectures or addresses upon the subjects of Medical Ethics and the Business Aspect of

the Practice of Medicine, and including the recommendation that graduates promptly join the local County Medical Society.

To Take Charge of the Research Work at Wistar Institute.—During the months of January, February and March Dr. Henry H. Donaldson, professor of neurology at the University of Chicago, will have charge and will conduct the entire work at the Wistar Institute. The appointment of Dr. Donaldson was made upon the recommendation of the Advisory Board, which is composed of some of the most eminent anatomists of this country.

Debarred From the Use of the Mail.—The post-office authorities at Washington, D. C., have instructed Postmaster McMichael to prevent certain "drug and remedy" companies from using the mail. The order is based upon the results of the investigation of the postal inspectors, who have determined that the business of these so-called "drug and remedy" companies is of an illegitimate and fraudulent nature. S. Regan, of 217 Drexel Avenue, Atlantic City, is denied the same privilege.

Meeting of the Pathological Society of Philadelphia.—The Pathological Society of Philadelphia held its regular meeting Thursday evening, September 28, where the scientific program was offered by Dr. B. Nisbit, who showed sections from the washings of the stomach. Dr. A. J. Smith reported a case of Multiple Tumors. Dr. A. Stengel exhibited (1) specimens of cirrhosis of the liver, (2) "Chronic Fibrous Myocarditis." Dr. C. Y. White presented card specimens. The nominations for officers for the ensuing year were made.

Hospital Receives State Charter.—The Roosevelt Hospital, a new institution in the northeastern section of the city has received a charter from the State. The Roosevelt was established in 1894 by Dr. Franklin Brady as a private concern at 1833 Chestnut Street, but finally charitable patients were admitted, the demands of which became so great that the above step was thought necessary. Temporary quarters have now been established at 1815 Frankford Avenue, but recently a new site has been acquired, where a modern building will be erected.

Work at the Maternity Hospital.—At a recent meeting of the Board of Directors of the Maternity Hospital the reports of this institution showed that in the three months ending August 31, 1905, 182 patients, including 19 remaining from May, were cared for in the hospital proper; 25 infants were born in the obstetric service, necessitating 152 visits from physicians; 447 patients visited the various clinics, and 417 prescriptions were compounded. These reports are very satisfactory to the board, and they believe the work can constantly and gradually be extended.

Convention of Homeopaths.—Last week saw the beginning and the end of the forty-second annual meeting of the Homeopathic Medical Society of Pennsylvania. One of the papers that commanded considerable attention was that of Dr. E. R. Gregg, who read of the "Scopolamine-Morphine Combination as a General Anesthetic." He treated 28 patients of all ages in the Pittsburgh Homeopathic Hospital by this method. A paper on the "Present Status of the Consumptive" was read by Dr. F. W. Boyer, of Pottsville. Dr. C. O. W. Bartine, of Philadelphia, read a paper on "Milk as a Factor in the Causation and Spread of Infectious Diseases." Another paper which commanded a great deal of attention was read by Dr. J. D. Boileau,

of Philadelphia, upon "Cause and Prevention of Yellow Fever." He took the ground that the mosquito was alone responsible for the spread of the disease. Dr. August Korndörfer, of Philadelphia, read an interesting paper on the "Work and Life of Hahnemann."

Report of the County Medical Committee.—At the regular meeting of the Philadelphia County Medical Society the committee composed of Drs. Francis M. Perkins, Charles W. Burr and Henry W. Cattell, and named at the meeting of the society April 20, 1905, for the purpose of acting in conjunction with the Coroner, the Director of Public Safety and with the District Attorney in securing evidence against and in prosecuting individuals guilty of performing criminal abortions, have handed in the following report: "Your committee begs leave to report that it has investigated over thirty persons making a practice of performing criminal abortions in the city of Philadelphia, and that at the present time each one of these has either left the city, is under police surveillance (6), is a fugitive from justice (7), is awaiting trial (7), or is in prison serving time (8). Your committee in its entirety or individually has paid frequent visits to Coroner Dugan, District Attorney Bell, Director Smyth, and Director Potter, and have been most courteously received by these gentlemen, and believe the support of the society in assisting them in the performance of their duties has been much appreciated. As an additional example of what has been done may be cited the case of one of the Philadelphia newspapers which formerly carried in its Sunday edition ten to seventeen advertisements of criminal abortionists, and which now no longer prints the objectionable kind of matter. So much having been accomplished, it is hoped that the County Medical Society will never permit this nefarious business again to assume such vast proportions in Philadelphia as was the case in the early part of 1904. It would seem to the committee that the only way to prevent this now that the city is largely freed from criminal abortionists, is to have the matter taken up by the State Medical Society and the American Medical Association, so that when the abortionists are driven from one city they will not immediately go to another place and carry on work of a similar nature. Thus several years ago an earnest endeavor was made to drive this class of persons out of Boston, and as a result Philadelphia received several of the worst specimens with which the authorities have had to deal. Then, too, it is so easy to live in New York or New Jersey and to come over to Philadelphia a certain number of days each week. If a central committee of the American Medical Association could be established with affiliating committees in the various large centers, your committee believes in the various large centers, accomplished thereby."

Brain and Arm Bequeathed to Wistar Institute.—General Wistar, who recently died at Claymont, Del., left the following will: "I, Isaac J. Wistar, of Philadelphia, widower, do make and publish my last will in manner following, to wit: I bequeath to the Wistar Institute of Anatomy and Biology my right arm, said to be a desirable specimen of gunshot ankylosis, and also my brain, both to be removed by said institute promptly after my death, and I direct my executor, before performing any other act of administration, to cause the remainder of my body to be cremated with all convenient dis-

patch, without ostentation or unnecessary expense, and to deposit the ashes thereof in an urn or other small vessel of inexpensive character, to be marked and sealed up in the mural crypt or recess prepared for that purpose in the main hall of the said Wistar Institute's museum building. The details of these dispositions may, if my executor so choose, be entrusted to my friends, the director and assistant director of the said institute, who know my wishes and will not refuse me that last service. I give and devise to the said Wistar Institute, and request it to preserve and maintain it in such plain and reasonable good order as it now is, my lot in Laurel Hill Cemetery, known as section 4, No. 114, which I inherited from my father, in which my deceased wife is interred, and in which my brother Thomas, but no other person, is to have the right of burial. Also my original share in the Library Company of Philadelphia, with the framed certificate authenticating the payment for any registry thereof, over the signature of B. Franklin, which descended to me from my great-grandfather, Richard Wistar, an original subscriber. Also the dress sword presented to me by the citizens of Philadelphia, with the correspondence relating thereto, my general officer's service sword worn by me in many celebrated engagements; my colonel's service sword worn at Ball's Bluff, Antietam and other actions, the scabbard of which was lost when I was wounded at the latter place; my epaulettes and all weapons, flags and trophies of war used or captured by me in the Civil War; my several military and other commissions from the State of Pennsylvania and the United States; the portrait of myself, all my books, my military, official, personal and other manuscripts, correspondence, orders and papers. All my clocks, oil portrait of my mother, all the movable furniture of my library and such other pieces of my household furniture as I may hereafter designate, or as the said Wistar Institute shall desire to have for permanent use in its buildings, all my pictures, photographs and engravings, and my personal recollections in two bound volumes of manuscripts, which, however, shall not be published, if at all, until at least five years after my death. After the payments of all the said several legacies, and of the taxes, repairs, insurance, maintenance and restoration, and all other necessary and lawful charges and expense that may be required for the protection and maintenance of my estate, I direct that all the rest, residue and remainder of my estate shall be transferred and paid over to the person, natural or corporate, who shall then be the trustee, lawfully holding the trust estate which was granted and settled by me for the perpetual use and benefit of the Wistar Institute of Anatomy and Biology, a charitable corporation of the State of Pennsylvania, which trustee is at the present time the Girard Trust Company, of Philadelphia, to be held upon the trusts and for the uses and subject to the terms, conditions, stipulations and limitations which are in the deed or declaration of trust, and shall thereafter be and constitute an inseparable part of the said trust estate for the sole and perpetual use and benefit of the said The Wistar Institute of Anatomy and Biology, as is in and by the said deed declared and limited to all the provisions, stipulations, conditions, limitations and remainders which are in and by the said deed settled, limited and declared. It is my intention that all the devises, bequests, legacies, annuities and benefits conferred by this my will, are given to

the said several beneficiaries on the express condition that no such beneficiary shall directly or indirectly dispute or contend concerning any clause or direction of my will, and in case of any contention or litigation I direct that the bequest, devise or legacy, and every other right or claim to any part of my estate of the beneficiary or of any other person so contending, disputing or litigating shall forthwith lapse, and become part of my residuary estate, to be disposed of as I have provided, or may provide, concerning such estate. And I hereby declare that I have no intention of dying intestate as respects any portion of my estate, and if any of the directions or disposition of this my will shall be declared invalid by any competent tribunal, in whole or in part, then the result thereof, so far as any change or modification may be thereby caused, shall inure to the advantage of the Wistar Institute of Anatomy and Biology, as the ultimate beneficiary, as herein provided and intended."

CHICAGO.

Contagious Diseases.—Except for a continued spread of diphtheria in South Chicago, the contagious diseases are steadily declining. No death from measles or scarlet fever occurred during the week, and there were marked reductions in the deaths from typhoid fever and whooping-cough.

Resignation of Dr. George F. Butler.—Dr. George F. Butler, author of Butler's *Materia Medica and Therapeutics*, has resigned from the College of Physicians and Surgeons, Chicago, where for nearly twelve years he held the Chair of *Materia Medica, Therapeutics and Clinical Medicine*.

Dedication of Hinsdale Sanitarium.—This sanitarium was dedicated September 20. The Hon. R. A. Childs, of Hinsdale, Ill., presided, and the dedicatory address, entitled "The Sanitarium Idea," was delivered by Dr. J. H. Kellogg, head of the Battle Creek Sanitarium. Other addresses were given by Judge Orrin N. Carter, Mr. Hastings H. Hart, and Dr. Homer M. Thomas.

CANADA.

The Army Medical Corps.—The permanent army medical corps of Canada is to consist of 150, all ranks. Nine will be stationed at London, ten at Toronto, eleven at Kingston, nine at Montreal, nine at Fredericton, twenty at Halifax and ten at Winnipeg. The remainder will be located in the west at places not yet stated.

Winnipeg General Hospital.—During the month of August, 1905, 613 patients were treated in the Winnipeg General Hospital, as against 512 in the same month in the previous year. The number of patients treated from January 1 to August 31, 1905, was 2,904, as against 2,412 for August in 1904. The outpatients treated in August were 395, as against 292 for August of the previous year.

Dr. R. A. Reeve, Toronto, Elected President of the British Medical Association.—On September 19 the physicians of Toronto had a meeting in the Ontario Medical Library to discuss the arrangements for holding the annual meeting of the British Medical Association in Toronto in 1906. A special committee was appointed to select another committee to advise with the local branch of the British Medical Association in Toronto as to the arrangements. Following this the local branch of the Association held a meeting. Dr. I. H. Cameron occupied the chair, and Dr. W. B. Thistle, the secretary

of the local branch, acted in that capacity. Dr. R. A. Reeve, Dean of the Medical Faculty of Toronto University, was unanimously elected President, and it was decided to have the meeting divide into twelve sections, the chairmen and secretaries of each being selected. It was also decided to have the meeting take place during the week preceding the Canadian National Exhibition, so that it may be expected to be held in the third week in August. A committee of arrangements will be appointed in the near future.

Montreal General Hospital.—During the week ending September 23 the regular quarterly meeting of the Montreal General Hospital was held in that city. Dr. Craik, formerly Dean of the Medical Faculty of McGill University, gave some interesting items regarding the growth of the institution. He stated that in 1854, fifty-one years ago, he was a house surgeon in the Montreal General Hospital, as was Dr. Ault, who was also present at the meeting. At that time there was a staff of eight or ten nurses, and the patients numbered between eighty and ninety in the year. He also gave an interesting account of the epidemic of Asiatic cholera in Montreal in 1854. During the quarter ending June 30, 1905, there had been treated to a conclusion in the wards no less than 803 patients. There had been in that quarter 55 deaths, 28 of which occurred within three days of their admission, giving a mortality rate of 3.34 per cent. In the out-door department there were 10,850 consultations, as compared with 9,072 for the corresponding quarter in 1904. The income for the quarter had been \$18,975 and the expenditure \$23,858. Dr. R. P. Campbell was appointed medical superintendent for another year. Owing to the increase in work in the out-door department it has been found necessary to make an addition to the staff as follows: Out-patient physicians, Drs. A. W. Gordon, B. W. D. Gillies and A. C. P. Howard; out-patient surgeons, Drs. E. M. von Eberts, A. T. Bazin, A. R. Pennoyer, C. A. Peters. The governors are asking wealthy citizens to donate funds to the extent of \$500,000 for an endowment.

The Management of the Ontario Provincial Hospital.—For the first time in the history of the province of Ontario the medical superintendents of the various provincial hospitals for the insane gathered in convention in the city of Toronto. This took place September 20, and was summoned at the call of the Hon. the Provincial Secretary, under whose department lies the administration of these institutions. It is the first of what will hereafter be a series of meetings on the part of those engaged in this department of medicine. Dr. G. A. MacCallum, Superintendent of the London Provincial Hospital, was chairman of the conference, while Dr. Beemer, the superintendent of the Mimico Provincial Hospital, discharged the duties of secretary. Dr. W. N. Barnhardt, of Toronto, contributed a paper, in which he advocated pathological work in these institutions, stating that we in Ontario were about ten years behind similar institutions in the United States. He thought that excellent work might be done by the present staff if they were relieved of some of their non-medical duties. In the discussion that followed this paper the general opinion was that there was lots of room for improvement in this direction. Dr. D. Campbell Meyers, Toronto, contributed a paper dealing with the prevention of insanity, and held that the first step in prevention was for the providing of better facilities for instruction of a clinical character for the medical student

in functional nervous diseases. Having this end in view, he advocated the establishment of wards or separate pavilions in connection with the general hospitals of the province for the treatment of the early acute cases of insanity. Following the reading of this paper, the chairman of the Board of Trustees of the Toronto General Hospital, stated that the Toronto General Hospital was prepared to undertake this class of work and would provide for the residence of the former superintendent, Dr. Charles O'Reilly, being used for this very purpose. The plan advocated by Dr. Meyers was endorsed by the meeting. There was a long discussion on the question: "Under what conditions should the insane be committed to jails?" Satisfaction was expressed that there are now fewer insane in jails in Ontario than formerly, but there yet remained room for considerable improvement, particularly with regard to the commitment of lunatics to jail by warrant. A resolution was adopted recommending that the system of committing lunatics to jails by warrant be simplified, and that magistrates be instructed against committing alleged insane persons to jail when application for the admission of sane to the asylums has not been made.

GENERAL.

Quarantine at Annapolis.—On account of the prevalence of typhoid fever and diphtheria at the Naval Academy, a rigid quarantine has been established. No midshipmen are allowed to leave the grounds.

National Purity Conference.—The National Purity Conference will be held at La Crosse, Wis., October 17 to 19. Delegates will be present from all of the United States and Canada. The purpose of the conference is to consider and discuss rescue work, law enforcement, divorce, race suicide and State toleration of the social evil.

New Orleans Fever Report.—With September practically gone, the yellow fever situation is under control in New Orleans, and as the days grow cooler the number of mosquitoes is expected to decrease. There is a steady inpour of people from all sections of the country. The most favorable feature of the report for the last twenty-four hours is the small number of persons now under treatment here. They number 283, the smallest list since August 8.

Hospital Superintendents' Conference.—A four-days meeting, the seventh annual conference, of the Association of Hospital Superintendents of the United States was opened at the Hotel Vendome, Boston, September 26. Among those who were expected to read papers was Sir Henry C. Burdett, K.C.B., of London, whose subject was to be "The Hospital World." Dr. George H. M. Rowe, of the Boston City Hospital, is president of the association.

Cholera Epidemic Checked.—Ambassador Tower cabled the State Department from Berlin as follows: "It is announced officially by the German Government that the cholera has been checked, and that any epidemic is entirely unlikely." This statement will be communicated by the Department of State to the Public Health and Marine Hospital Service, through the Treasury Department, in order that it may modify, if it sees fit, the restrictions which it has been obliged to impose upon emigration through German ports.

Public Health Association.—Physicians, surgeons and bacteriologists from all parts of the United States and from Canada and Mexico met in Boston last Monday to attend the thirty-third annual meeting of the American Public Health Association, which opened

Monday, September 25, and continued until Friday night. Subjects for discussion touching the preservation of public health have been prepared, covering a wide range. Section meetings were held Monday at the medical library in the Fenway. The convention proper opened its sessions Tuesday, September 26.

Vermont's Senator Donates a Tuberculosis Sanitarium.—Senator Redfield Proctor, of Vermont, in a letter to Dr. W. N. Bryan, of Ludlow, Secretary of the Vermont State Tuberculosis Commission, announces that he will purchase a site and erect a sanitarium at a cost of about \$50,000 in this State for treatment in incipient cases of tuberculosis. The building will accommodate from twenty-five to thirty patients. In addition the Senator says he will give \$100,000 as endowment for the institution. He suggests that a board representing all sections of the State, headed by the Governor, be selected to have charge of the sanitarium and to provide that if the State at any time wishes to assume the charge and maintenance of the institution it may, in the discretion of the trustees, be turned over to the State with all its property and funds. The site has not been announced, but will be selected soon. The Senator says he makes the gift at the request of his children.

Military Surgeons Meet.—With a gathering of 150 delegates representing the armies or navies of Japan, China, Mexico, Great Britain, the Dominion of Canada, Guatemala, France, and the United States, and the National Guard of many of the States in this country, the fourteenth annual meeting of the Association of Military Surgeons of the United States opened in Detroit, Sept. 26. Reports from officers and committees were read at the morning session. Surgeon-General Walter Wyman of the Marine Hospital Service, president of the association, was unable to be present, and Col. A. M. Briggs, of Buffalo, the vice-president, read his report. The report of the secretary, Major J. E. Pilcher, of Carlisle, Pa., noted an increase of membership from 1,800 to 2,000. A report from the legislation committee indorsed the army bill which provides for increasing the number of medical officers in the army and the establishment of a medical reserve. Major Jefferson Randolph Kean, U. S. A., of Washington, D. C., was announced as the winner of the Seaman prize for 1905. This is a prize of \$500 offered for the best essay on "The Prevention of Disease in the Army and the Best Method of Accomplishing that Result."

The Army Canteen.—It is not to be denied, writes the *New York Times*, that the experience of the army canteen furnishes a serious argument against female suffrage. It is quite notorious that it has been by the efforts of the W. C. T. U. that the judgment, the practically unanimous judgment, of the officers of the United States Army with respect to the best means of promoting temperance in the army has been nullified. This year, it appears, once again, has that judgment been expressed, again with practical unanimity, by the reports of all the department commanders. They are the only expert witnesses. And they corroborate one another from their widely different stations and points of view. In any question in which sentiment was not allowed to play a disproportionate part, such a consensus would be conclusive. But it seems that members of Congress allow the sentiment of persons who know nothing about the matter in hand to outweigh the opinions of those who know all about it. There is grave doubt whether, in spite of all this consensus, the most practicable expedient for promoting temperance in the army will be again adopted. Mr. Rudyard Kipling, in the character of a Prince of India, once

wrote a fierce satire upon the British legislation which similarly went counter to the facts of the case, as these were certified by the most competent witnesses. The Indian Prince declared that it was the "barren women," meaning the women who had nothing more important to do than to regulate affairs of which they were grossly ignorant, who dictated the legislation of Great Britain. If Secretary Taft has the courage of what must be his convictions on the subject of the army canteen, the subject will again be pressed upon the attention of Congress. It will once more be brought to proof whether the testimony of expert witnesses shall or shall be allowed to weigh against what one must call the combined ignorance and impudence of those who know nothing at all about the matter in question.

International Surgical Society.—At the first Congress of the International Surgical Society, held last week at Brussels, the subject of the treatment of general peritonitis was formally introduced by six "Rapporteurs" from various countries. These were: Dr. P. L. Friedrich (Leipzig), Dr. A. Krögius (Helsingfors), Dr. M. K. G. Lennander (Upsala), Dr. F. Lejers (Paris), Dr. A. J. McCosh (New York) and Dr. E. de Isla (Madrid). On a few points there was more or less difference of opinion as to the best methods of treatment; on others all were agreed as on the value of salt infusions during and after operation. The points in dispute were the questions of (1) Invariable operation (except in moribund cases). Four of the speakers approved of immediate operation in all cases. Two doubted the universality of this rule. (2) Anesthesia. The speakers were about equally divided as to the respective advantages of local and general anesthesia. (3) Incision. A long median incision, with secondary openings, was advocated by two speakers; a moderate by three, and a short single by one. Irrigation in a thorough manner was recommended by two speakers; in a modified manner by two, whereas dry sponging in cleansing was preferred by two. Salt solution was universally advised. All antiseptics discountenanced. Evisceration of intestines was rather discountenanced by all the speakers. Drainage, with extensive packing by means of gauze tampons, was advocated by two speakers. Very scant drainage by two, and two were rather doubtful which plan was most advisable. Also two were in favor of multiple openings for drainage. Entire absence of drainage was opposed by all. Enterostomy. This subject received the fullest discussion. The formation of one or more intestinal fistulae was warmly advocated by three. The other three were in doubt as to the advisability of this procedure, at least in the great majority of cases. Fowler's position was advocated by three. A general discussion followed the reading of the six papers.

Harvard Medical School.—The Harvard Medical School opens on October 1 this year with certain very marked change in its curriculum. Beginning with the year 1900 the so-called concentration system was adopted; i.e., for the first half of the first year Anatomy and Histology were the only subjects taken up; during the second half students devoted all their time to Physiology and Physiological and Pathological Chemistry; in the first half of the next year Pathology and Bacteriology were studied, while during the second half of the same year a wider variety of subjects was taken up, preparing the student for the clinical work of the last two years. The work of these last two years was practically all prescribed. This year under the new system while the first two years remain the same, the greater part of the prescribed work is put into the third year, and the fourth is purely elective. One thousand hours

is the minimum requirement for each fourth-year student; this time, under certain supervision, he may divide among as large number of electives as he chooses. For the convenience of the students these electives are arranged in groups, a certain group being recommended for the man who intends to go into general practice, and another for those men especially interested in surgery. Men desiring to take up work along special lines, scientific medicine or otherwise, may select their electives with this end in view, providing they include the necessary one thousand hours of work and meet with the approval of the Advisory Board. This change makes the third year, in the past always the hardest, decidedly more so, giving the student fifteen to eighteen examinations in the spring of that year; the success of the fourth year depends much on the intelligence of the student in the selection of his electives; this factor, now that a college degree or its equivalent is required for admission to the school, is not such an altogether doubtful quantity as when the high-school graduate went directly into the study of medicine. The new buildings will be ready for occupation in the spring of 1906. The exterior of all is now practically completed, and the beautiful white marble group is rapidly becoming a sight very worth while going out of one's way to see. It is hoped that a broad boulevard can be made leading from the city directly out to what is to become a great educational center; the building of this avenue is, however, as yet very uncertain.

The Senators Who Smirched a State's Fair Name.—Georgia, writes *Charities*, has again furnished the annual demonstration of the truth that her civilization stands somewhat lower than that of England a century ago. Georgia has once more cast her annual vote against affording any protection whatever to the tiny children in her cotton mills. For another year it will remain legal for little girls five and six years of age to work throughout the night, eleven hours, whenever it may prove profitable to the mills to work night shifts. Year after year Georgia rejects a bill which would, if enacted, prohibit all work in cotton mills to children under the age of ten years. Sir Robert Peel's bill of 1802 is still in advance of public opinion in Georgia. Lord Shaftesbury's bill of 1842 is still too merciful for the people of that State. Compared with Georgia, Alabama (where little girls may work in mills eight hours at night on reaching the thirteenth birthday) is a modern and enlightened State. Compared with Georgia, South Carolina (where children of ten years may work in mills in the summer provided that some time during the year they have attended some school throughout four months) appears well forward in the ranks of the enlightened. Compared with Georgia, Russia (where no child under age of twelve years may be employed in any mill) appears tender in its care of childhood. This action of Georgia is deliberate. It is taken, year after year, at the close of long debates in the Senate. It is by the vote of twenty-three senators that the year 1905 is placed in the black list of years in which Georgia advisedly sacrifices her little boys and girls to the greed of her manufacturers. The list of enemies of the children of Georgia as published in the *Atlanta News* is as follows: Adams, Alsobrook, Bennett, Blalock, Bond, Bunn, Carithers, Copelan, Fitzgerald, Foy, Graybill, Hamby, Hand, Lumsden, McAllister, Odum, Parker, Peyton, Phillips, Rose, Sirmans, Wheatley, Williams. Many northern corporations have branches in Georgia. The writer has seen the splendid, modern equipment of the Merrimac mills, the Massachusetts mills, and the beautiful village of the New York mills at Aragon. Are these northern corporations guiltless of in-

fluencing the votes of the twenty-three enemies of the little white children of Georgia? The disfranchised black men of Georgia may well feel a certain satisfaction that it is only the white children who are employed in the cotton mills; and that all these senators are white men. Thinking citizens of this republic, however, must recognize the sinister fact that progress in legislation in all States in which the cotton industry thrives is hampered by the competition of manufacturers in Georgia whose cruel privilege of wearing out and destroying little white children has thus been extended a year by the twenty-three senators of Georgia whose names should be familiar in every home in the nation.

A Medical Estimate of Prayer.—At the recent annual meeting of the British Medical Association a testimony was given to the therapeutic value of prayer which, says *The Outlook*, should be recorded over against the skeptical views of some scientists. Dr. Theodore B. Hyslop, Superintendent of Bethlem Royal Hospital, has a reputation as a specialist in neurology and in the treatment of mental disease which adds weight to his words: "As an alienist and one whose whole life has been concerned with the sufferings of the mind, I would state that of all hygienic measures to counteract disturbed sleep, depressed spirits and all the miserable sequels of a distressed mind, I would undoubtedly give the first place to the simple habit of prayer." It matters not, in Dr. Hyslop's view, what are ones' theological conceptions—anthropomorphic or rationalistic—of the infinite environment with which prayer attempts to commune; the effect is the same: "Let there but be a habit of nightly communion, not as a mendicant or repeater of words more adapted to the tongue of a sage, but as a humble individual who submerges or asserts his individuality as an integral part of a greater whole. Such a habit does more to clean the spirit and strengthen the soul to overcome mere incidental emotionalism than any other therapeutic agent known to me." Mediæval superstition, connecting medical art with magic supposed to be learned from evil spirits, used the proverb, "*Ubi duo medici, tres atheni*." In some quarters this stigma is not yet entirely effaced and medical men are perhaps not fully free of responsibility for whatever of it lingers. On the background of such a history Dr. Hyslop's testimony before an audience of specialists is highly significant of the trend of scientific thought away from materialistic conceptions of mind and of religion. "I believe it," said he, "to be our object, as teachers and physicians, to fight against all those influences which tend to produce either religious intemperance or indifference, and to subscribe, as best we may, to that form of religious belief, so far as we can find it practically embodied or effective, which believes in 'the larger hope,' though it condemns unreservedly the demonstrable superstition and sentimentality which impede its progress." Not many years ago Professor Tyndall's challenge of the religious world to try a prayer-test on a selected number of hospital patients was deemed by many, upon its being declined, to have refuted the claim of a healing power in prayer. As a physicist, Tyndall was, on this subject, not within his own province, as Hyslop, a psychologist, is. Religious men, to be sure, have made extravagant claims, and scientific men also have shot beyond the mark. But Dr. Hyslop's competence to speak in the name of science is unquestionable, and what he affirms as a discovery of medical science is identical with the immemorial faith of religion, that there is a place for prayer in the very nature of things. Not only does he find this place to be foremost among restorative agents. Of the religious enthusiasm which the nature of prayer

is to feed and sustain he affirms that it "embodies the most healthy and preservative development of our social forces." Among the many notable utterances in which science is now evincing herself to be the handmaid of religion, these, the most recent, are as memorable as any.

Atlanta (Ga.) School of Medicine.—This school has just been organized. It will be open on October 3, 1905. Ample accommodations for the coming winter have been secured in the new and elegant Masons' Annuity Building, corner Edgewood Avenue and Ivy Street. Quarters for dissection consist of the first floor of the Masons' Annuity Building. This comprises an office; two lecture rooms, one with a seating capacity of two hundred and the other of one hundred; an operating room with sterilizing and anesthesia rooms adjoining; a private room for professors. A waiting room and adjoining rooms in the basement for the examination and treatment of outdoor patients. A large, well-lighted laboratory equipped with an abundance of chemical apparatus on the third floor; also on the same floor a laboratory for histological, pathological and bacteriological work well stocked with the finest Bausch & Lomb microscopes and other apparatus such as these laboratories need. No medical students in Georgia will be more abundantly supplied with dissecting material. Dissecting will be done outside the building proper, a half block away. Operations on cadavers will be made a special feature of the session's work. Most of the men whose names appear as members of the faculty are already well known to the profession. They have entered into the project with full knowledge of ample financial backing for the future. They have further entered upon the task before them with the specific intention of building up an institution of high grade rather than a necessarily large one. It is intended, just as soon as possible, to qualify for membership in the Association of American Medical Colleges. No College south of Richmond and Louisville belongs to that Association. There has been developing for quite a while a sentiment that there ought to be in the South a medical school whose diploma would entitle one to practise medicine in any part of the United States. Students need therefore have no fear whatever about their certificates, etc., being recognized by other regular medical colleges. This school is not organized to fight any other school. A mistake made by most medical colleges in the South is that they are run to make money. This institution is not run for that purpose. Advanced standing of one year will be given students holding degrees from Literary colleges and to graduates in Dentistry and Pharmacy. One or more previous courses in any regular medical college will be recognized and the student advanced accordingly. The first and second years will be devoted to Anatomy, Physiology, Chemistry, Materia Medica and Histology; the third and fourth to such subjects as are usually taught in these years in other medical colleges. The fees for the coming session will be forty dollars whether the student be in the first, second, third or fourth year. No other fees of any kind will be charged, except a graduation fee of twenty-five dollars. As the expense of erecting a building has not been incurred, the expenditures for the coming winter will be small and the tuition can be placed thus at a low figure. Dr. Edward G. Jones particularly desires it to be known that any past promises made to students by him as late Registrar of the Atlanta College of Physicians and Surgeons will be redeemed in the Atlanta School of Medicine. The Proctor, or his representative, will be at the college building, corner Edgewood Avenue and Ivy Street, to

matriculate students and look after all other duties in connection with the school. Students are advised to register as soon as they reach the city. Good boarding-houses are abundant near the college. Address all communications to Dr. Geo. H. Noble, Dean, or Dr. Edward G. Jones, Proctor, Atlanta School of Medicine, corner Edgewood Avenue and Ivy Street, Atlanta, Ga.

OBITUARY.

Dr. C. ALFRED GRYMES, formerly a member of the Stock Exchange firm of Henry G. Stebbins & Sons, died of heart disease at his home, 38 Union Square East, New York, last week. Dr. Grymes was a graduate of Harvard University and the College of Physicians and Surgeons in Philadelphia. Dr. Grymes entered his father-in-law's firm after practising medicine four years.

Dr. F. A. BALDWIN died last week at his home, 129 West Seventy-seventh Street, New York. He was born in New York in 1846, and was graduated in 1881 from Bellevue Medical College. He served in the Eastern Dispensary until 1886, and from 1884 until 1895 he was attending surgeon to the outdoor department of Bellevue Hospital. From 1885 to 1889 he was assistant to the late Dr. Alexander B. Mott, who held the chair of clinical surgery in the Medical College. He was a member of the American Medical Association, of the New York Medical Association and of the New York County Medical Society.

CORRESPONDENCE.

A NEW BROOM SWEEPS CLEAN.

To the Editor of the MEDICAL NEWS:

DEAR SIR: Delight in character study is the excuse for presenting what follows; even at the risk arising from the use of an awkward expression for a title, whose like Lord Chesterfield has condemned so much. The search for sterile materials for the surgeon's use leads along a devious path. Thus, sinews from a rat's tail and a heron's legs are some of the latest suggestions. The employment of wire taken from a new broom, as incidentally mentioned in the present instance, is along the same line.

The wife of a financially successful artist, engaged with him in living out that erratic sort of career which society styles Bohemian, related to me sometime since an original method employed by her to restrict the size of her family. Always regular in her menstrual periods, save for the interruptions of pregnancy, the woman, now past forty, possessed of an attractive personality, high spirits and seeming robust health, is the mother of three grown children. After experiencing the pleasure of mothering two children early in her married life and becoming pregnant a third time, a young practitioner suggested to her the error of sacrificing good looks to a numerous progeny. Showing the woman an ordinary uterine sound, the doctor instructed her how it might be used, and explained that while he could not perform such an operation himself, would gladly lend her the implement. Declining to carry out the abortion under such circumstances, the woman's fear was overcome a few weeks later by a sharpened wit. By unwinding she secured the wire which binds the splint bundles to the handle of a broom and with scissors cut out a length of about twenty inches of the bright interior. Doubled at the middle a flexible blunt-pointed implement was secured, of which she had no fear to use, and after some further preparation by scrubbing the wires with soap and water, passed the instrument along her vaginal tract into the uterus with a prompt, uncomplicated re-

sult. Subsequent experiences taught the woman that about the second month was the best time for interrupting her pregnancies, and that a new broom supplied the cleanest wire. During a period spread over twenty-five years of married life this lady has successfully produced by the means described fifteen consecutive, with one exception, abortions. The break in the mortality rate of this auto-operator shows another phase of the woman's character. Controlled by a vivid dream when about making up her mind to commit the depredation, the thought became fixed that the present occupant of her womb would become a daughter, beautiful as herself and with a mind to match. Her hand thus stayed, the birth of a daughter at term fulfilled the first part of the prophesy. The rest is borne out in the individual herself, who now, grown to womanhood, bears a striking likeness to the mother. Her mind will probably never get the stimulation which her mother's has experienced, for she is married to a man many years her senior, and who, possessed of wealth, is controlled by her slightest wish. Those who accept the theory manifest the glib phrase of the Christian Scientists, namely, control of mind over matter will not scoff at the instance which leads one into the occult sciences, just given.

For the unbelievers it may be stated that the woman had nothing but her own whim to control her regarding the number of children she should have. Furthermore, she has not had a similar dream since, but she has had twelve abortions. Regarding acceptance of the truth of the whole story, the woman's eldest daughter was present when he mother gave me her sexual history; she, having been present upon several occasions, was able to corroborate the details. This impressed me not only with the truth of her statements, but of the happy relationship of perfect confidence existing between mother and daughter. This daughter, as well as her brother, it might be remarked, are as commonplace as the younger sister is brilliant. The woman, who is now about in her menopause, viewing a case of spear and dagger-like implements used by the French laity for producing abortion, and collected by me several years ago in Paris, passed them with the comment that "those French women would run any risk."

To set forth the depth and gradual dissemination throughout society of the question of production of children, the following case has but just passed from my notice. A Russian Jewess, the wife of a poor painter of the same nationality, is the mother of nine children, and has been a resident in America some five or six years. Under cocaine anesthesia I operated upon her toe for ingrowing nail. When about to be discharged, after the completion of treatment, the reason for her wish and change, which she effected, from being a patient in a public clinic to a private one, became apparent. Feeling herself to be pregnant, the woman desired to be relieved of the product of conception. Unable to gratify her request, she announced to me "that not for twenty thousand dollars would she bear another child," and left me with fixed determination to find the way to gain her wish.

FREDERICK GRIFFITH.

Tested Eyes Before Fight.—Surgeon-General S. Suzuki, of the Imperial Japanese Navy, addressing the convention of military surgeons in session in Detroit, told how the Japanese surgeons before every engagement carefully inspected the eyes of all gunners on the warships. They were all tested with reference to refractive errors in particular.

SOCIETY PROCEEDINGS.

AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

Eighteenth Annual Meeting, held Sept. 19, 20 and 21, 1905.

The President, Howard W. Longyear, M.D., of Detroit, Mich., in the Chair.

(Continued from Page 661.)

Indications for Hysterectomy in Puerperal Septicemia.—Dr. Charles Green Cumston, of Boston, stated that hysterectomy applied to the treatment of acute puerperal infection is as yet a mooted question as far as its indications are concerned, and it would be quite as illogical to advise this inference in all serious cases as it would be systematically to condemn it. All surgeons seem to be in accord as to the great difficulty of formulating the indications for this operation, and especially the time when these become formal. To come to a conclusion all clinical methods of examination and those of the laboratory must be employed. The latter, however, are far from being of equal value, as no positive result can be obtained from a bacteriological examination of the lochia or blood. Cytological examination of the blood will give excellent data as far as the prognosis of the type of infection is concerned. Clinically, there is no one valuable sign, but taken altogether the symptoms obtained by careful intrauterine examination may indicate the necessity of surgical intervention when all other therapeutic procedures have failed. Septicemia occurring at once after labor cannot derive benefit from surgery, but, on the other hand, it would appear that hysterectomy is indicated in cases of secondary septicemia with a slow evolution, or those taking on a pyemic type proceeding by successive stages, without visceral metastases, in which case surgical treatment would be a method of exception.

Abdominal Hysterectomy for Multiple Fibroids Complicated by Pregnancy.—Dr. J. Henry Carstens, of Detroit, Mich., reported the case of a woman, forty-two years old, who was never pregnant before. A tumor was noticed for five or six years, but not accompanied by hemorrhage. Menstruation was regular until May; there was a slight show in June and July. He operated in the middle of August. The growth became rapid during the last three months. Patient recovered from the operation for the removal of the tumors.

These cases are not uncommon, still they are sufficiently rare to warrant reporting them. In nearly all cases the women are sterile; the growth develops, and after some years they become pregnant, which makes one suspect that there was some abnormal condition of the uterus, perhaps some malposition which prevented impregnation, but as the result of the growth the uterus was pulled up or shoved over in one direction or another in such a way that the ova could pass into the uterus and pregnancy occur. This seems to him the correct explanation of the occurrence of pregnancy in sterile women after the development of fibroid tumors.

In reference to general rules for these cases, the cases vary so much that no definite rule can be laid down to govern all cases, but on general principles he thinks cases of fibroids complicated by pregnancy can be left alone if they are subperitoneal and located at the upper half of the uterus. Fibroids

located in the lower half of the uterus or in the broad ligament should be removed. Fibroids adherent or complicated with other pelvic diseases should be removed by enucleation, or in some cases an abdominal hysterectomy should be performed.

Personal Experiences in Myofibroma of the Uterus.—Dr. Miles F. Porter, of Fort Wayne, Ind., presented some of the more important facts gained from the treatment and observation of over 125 cases of myofibroma of the uterus. The earlier cases having been seen during a rather exacting general practice, and many of them operated away from home, in private houses, without adequate assistance, accounted for the fact that the records of this part of his work were imperfect. Of the 125 cases, more than 100 were subjected to supravaginal hysterectomy. Two vaginal hysterectomies were done, and in a few cases the tumors were removed per vaginam without opening the peritoneal cavity. No vaginal myomectomies were done in which the abdomen was entered. Myomectomy through the abdomen was done six or eight times only, except cases in which small fibroids were removed during celiotomy for other causes, and these were not considered. Hemorrhage was not so prominent a symptom as was generally thought. In two cases this was the immediate cause of operation, and in one it manifested itself first after establishment of the menopause. Pain, especially during the menstrual period, had been the most common symptom. Only one case of pyosalpinx as a complication was seen. In one an eight and one-quarter-pound tumor was removed from a four and one-half months' pregnant uterus. Normal labor at term followed, and one child had been born to the mother since without accident. In one case the pregnant uterus was removed for pain, on the theory, which the specimen proved correct, that the woman could neither miscarry nor carry the child to term. The third was operated because of mild sepsis due to retained fetus. Both recovered. Women with fibroids were peculiarly liable to infection following labor, miscarriage or menstrual flow. In several cases this danger was the chief indication for operation. Three cases were reported to support this opinion. Rapid growth of fibroids during pregnancy was believed to be more apparent than real. Partial or complete sterility was common in fibroid patients. But one case of malignant degeneration was seen. But one case died. This was due to the breaking-down of a large vaginal tumor, coexisting with a large abdominal tumor. Both were removed through the abdomen. Removal of the vaginal tumor per vaginam by morcellation, and an abdominal hysterectomy later would probably have saved the patient, who died from the effect of the sepsis from which she was suffering at the time of the operation, combined with the effect of the shock and loss of blood. One case of dermoid of the ovary with multiple fibroids was met with, one practically a pure myoma, and one fibroid of the ovary complicating fibroid of the uterus. Oophorectomy for fibroids was not a justifiable operation, as it neither stopped the hemorrhage nor the growth of the tumor. The ideal operation for myofibroma would leave the genital tract intact, or as nearly so as possible within reason. The tubes should always be removed when operation rendered pregnancy impossible. Healthy ovaries should be left, as should healthy cervixes. Whether to operate through the vagina or through the abdomen might be determined before the opera-

tion began, but the details of the technic should be developed as the operation proceeded. In rare cases the elastic ligature was of service. Twice the bladder was cut, but was immediately repaired, and no harm resulted. One case had a hemorrhage from a split of the broad ligament, which occurred the night following the operation, as a result of the patient starting violently during a dream. No trouble from silk as ligatures was experienced, but because of the evidence against it, catgut was substituted as soon as he learned to sterilize the latter by heat. The death rate of abdominal operations need not be over two per cent., and vaginal operations involving the peritoneal cavity should not be above one per cent.

Unusual Dilatation of Cornual Blood Vessels, with Rupture Into the Uterine Cavity Hysterectomy.—Dr. Frank F. Simpson, of Pittsburg, Pa., reported this interesting case, and stated that apart from their association with neoplasms, vascular changes are not infrequently found when persistent bleeding occurs near the menopause. Arteriosclerosis is rather common; but aneurism, aneurismal varix and varicose veins occurring within the myometrium are rare. In this instance there was an excessive vascularity of the uterus, with sclerotic arteries and varicose veins. The sclerosis is found in its several forms, varying from a slight nodular infiltration of the intima to complete obliteration. In addition we have the unusual spectacle of greatly dilated varicose veins which were the subject of repeated spontaneous rupture with repeated spontaneous closure. In the author's case there was a clinical picture which portrays the perils of this disease in its most serious form. In the well-marked cases that have come under his observation arteriosclerosis of the uterine vessels has been accompanied by menorrhagia and metrorrhagia, which began between the ages of thirty-eight and forty-five. They grew more and more pronounced, and yielded only to hysterectomy. In this case, however, the first symptom was a furious hemorrhage due to the rupture of a large varicose vein into the uterine cavity. Within two months three other hemorrhages burst upon her without warning, and each imperiled her life.

The gross pathological findings make it clear that without surgical intervention hemorrhage or infection would inevitably have closed the scene within a short while.

Primary Bowel Resection Versus Artificial Anus in the Treatment for Strangulated Hernia.—Dr. John Young Brown, of St. Louis, Mo., limited himself to a discussion of the surgery of those neglected cases in which at the time of operation the intestine found in the hernial sac is so damaged that the operator is forced to resort to one of two procedures—the establishment of an artificial anus, or a primary bowel resection. During the last eighteen months he has operated upon seven cases of strangulated hernia; four of these were males, three females. In four the hernia was of the inguinal variety, and in three of the femoral type. In all primary resection was done, followed by a radical operation at the hernial site. Of the seven cases, six recovered and one died. The oldest patient was seventy years, the youngest twenty. The duration of strangulation, longest fifty-seven hours, shortest nine hours. Amount of gut removed, largest four feet, smallest eight inches. Gut involved small bowel. In each case the condition of the small bowel, which was the part involved, was such as to leave no question concerning the

advisability of its removal. In all the resection was done through a supplemental abdominal incision, and the anastomosis was made with the Murphy button. The results obtained he attributes to the careful attention to certain points in the operative technic, a neglect of which he believes has been responsible for the high mortality invariably accompanying the surgical treatment of this condition.

A Study of the Etiology of Floating Kidney with Suggestions Changing the Operative Technic of Nephropexy.—The President, Dr. Howard W. Longyear, of Detroit, selected this as the title of his Presidential Address.

December 17, 1903, while operating on a young girl of sixteen years of age for appendical disease, the writer accidentally discovered that the right kidney, which was normally placed, could be easily pulled down and held in a firm position of complete prolapse by making traction on the cecum. This led to further observation on the etiology of displaced, loose or floating kidney, both on the cadaver and on the living subject, and afterward, as a result of those observations, to efforts to devise an operation that should have for its object the retention of the kidney in its normal position, as well as the anchoring of the ascending colon in such a manner as to remedy the prolapse of the cecum, which usually obtains in these cases, so that it should not exert further traction on the kidney and through it on the duodenum and renal vessels. The object of the address is to record the results, though unfinished, of these observations. The fact that the kidney in question could be pulled down and held firmly in this position by traction on the cecum and ascending colon was an indication that there exists a more firm and positive attachment of this viscus to the kidney than is generally believed.

After considering the literature of the subject, the writer naturally assumed that the kidney of his patient was pulled down by the adhesion of the peritoneal attachment, or mesentery of the colon to the fatty capsule of the kidney, and yet the firmness of the attachment was an apparent contraindication. With the object of testing this point, three cases of floating kidney were operated upon. The peritoneal cavity was entered through the usual incision in the loin, the redundant mesentery gathered up and attached to the incision of the fascia close to the twelfth rib at the upper angle of the wound. In the first case of extreme ptosis, having had Dietl's crises for several years, the case with which the operation was performed, the amount of slack mesenteric tissue brought out and attached, and the immediate result which it had of entirely replacing the kidney so it could not be pushed down into the abdomen, were very encouraging.

In the second and third cases, however, in both of which the displacement was less pronounced, there was practically no mesentery such as was present in the first case, so that the peritoneal fixation seemed to promise less. However, while drawing out the peritoneal attachment of the bowel and making efforts to push the bowel down, away from the kidney, it was noticed in both cases that there was a cord-like structure passing downward from the lower pole of the kidney, which prevented the separation of the kidney and bowel. This was included with the peritoneal tissue and attached with it. Further investigation of the literature failed to enlighten the author as to the presence of any tendinous prolongation from the lower pole of the kid-

ney, so further investigation was made on the cadaver. The dissection on the cadaver was described at length. The whole upper half of the abdominal parietes being incised and turned downward, the cecum, ascending colon, with hepatic flexure and kidney on the right side, and part of the descending colon, with splenic flexure and kidney on the left side, were removed, the dissection being made from below upwards and the organs removed together in such a manner as not to interfere with their normal attachments to each other. On turning the specimens over the posterior surface of bowel and kidney on each side showed a similar formation of tendinous attachment to each other. This was found to be formed by the gathering together of fine longitudinal fibers from the fibrous network which forms the framework of the fatty capsule. The tendinous ridge, formed by its attachment to the posterior surface of the ascending colon, could be followed easily between the peritoneal reflections down to the margin of the lower peritoneal attachment of the bowel and close to the junction of the ileum—in fact, near the point of the so-called origin in the female subject of the suspensory ligament of the ovary. A specimen illustrating the presence of this phrenocolic ligament was exhibited.

How much of an etiological factor is this embryological remnant in the production of displaced kidney? This ligamentous union of the kidney and bowel, the author claims, is the most important factor in the etiology of nephroptosis.

An operation which he has found the most easy way of accomplishment is the fixation of this nephrocolic ligament into the upper angle of the wound without severing it from the colon, and also fastening the redundant mesentery, if it be present, in the lower angle of the wound. The convergence of the framework of the fatty capsule into this ligament makes a structure of sufficient strength to be depended upon to hold the displaced organs, if securely attached to the aponeurotic tissue, preferably where it is thick near the twelfth rib.

Intestinal Obstruction.—Dr. Lewis C. Morris, of Birmingham, Ala., said that delay in operating for the relief of ileus is due to one of two things: (1) Assuming that the diagnosis has been made, the adoption of expectant treatment with the hope that it will relieve the condition, or that it will recover spontaneously; or, (2) the delay resulting from a failure to make a positive diagnosis. The author reported six cases of intestinal obstruction, and believes that if all such cases could be given the benefit of operation the mortality in this conditions would be completely revolutionized. The fact that some cases exist for days and are relieved by operation leads, in cases in which there is an element of doubt, sometimes to delay in surgical interference until the chances for recovery are materially lessened. Occasionally a positive differential diagnosis is very difficult, but the conditions from which a differentiation cannot be positively made are almost invariably equally as imperative in their demand for surgical intervention as would be the existence of an ileus.

Diagnosis.—Dr. John B. Deaver, of Philadelphia, endeavored to place the matter of laboratory diagnosis in its proper light, showing that it is after all only one form of diagnosis by pathognomonic symptoms. He tried also to make a plea for the more thorough education of medical students in the principles of physical diagnosis and in the knowledge of the natural history of surgical diseases; while at the

same time advocating a postponement of laboratory methods until the former have been completely mastered. He endeavored to show the real danger which, as it seems to him, exists of the modern surgeon degenerating into a mere mechanical appliance subject to the controlling mind and will of the laboratory diagnostician. Yet, while above all things discountenancing haste and carelessness in reaching conclusions, and the judicious resort to the therapeutic test of exploratory operations, he pointed out what seems to him the legitimate fields of the exploratory incision.

Appendicitis as a Factor in the Diagnosis and Treatment of Abdominal and Pelvic Tumors; Also Complicating Pregnancy.—Dr. Rufus B. Hall, of Cincinnati, Ohio, believes that the diagnosis of appendicitis, when associated with pelvic and abdominal tumors, or in the pregnant woman, has not received the attention on the part of the general profession that the subject deserves. He wishes to call attention more forcibly to the early recognition of the cardinal signs of appendicitis in these cases. It is the common supposition on the part of the general profession that when a patient known to have an abdominal or a pelvic tumor, is taken suddenly ill with pain in the abdomen, that there is something wrong with the tumor and the cardinal signs of appendicitis are ignored or overlooked. Dr. Hall then discussed the differential diagnosis of appendicitis complicating fibroid tumors of the uterus and ovarian tumors; differentiated diagnosis of appendicitis complicating tubal disease; differential diagnosis of appendicitis associated with pregnancy; the treatment of appendicitis complicating fibroid tumors and ovarian tumors and tubal disease; also the treatment of appendicitis associated with pregnancy.

Cesarean Section.—Dr. Henry Schwarz, of St. Louis, Mo., reported the case of a child wife who was in labor sixty hours, with repeated attempts at forceps delivery by the family physician. Apparently she was not infected. Instead of a Porro, as is usual in such cases, he did the classical Cesarean operation, which was followed by recovery of the mother. The baby was asphyxiated; membranes and amniotic fluid yellowish green. His assistant worked over the baby an hour at artificial respiration before spontaneous breathing was established. Pressure marks on the scalp showed locking of the head between the promontory and symphysis; necrotic tissue dropped out a few days afterwards, and baby recovered.

Pregnancy Associated with Diabetes.—Dr. Magnus A. Tate, of Cincinnati, Ohio, mentioned the reports of numerous investigators, calling attention to sugar in the urine of pregnant women. He collected all cases that could be found in medical literature where pregnancy was complicated by diabetes. He reported an additional case, and presented a study of these tabulated cases as to their frequency, results, mortality and other similar data.

Cysts of the Mesentery.—Dr. Orange G. Pfaff, of Indianapolis, Ind., said that these growths are comparatively rare; their diagnosis is difficult, if not impossible; their pathology is not fully and clearly understood, but most of them, if not all, are of probable embryonal origin.

Abdominal Pregnancy Persisting Beyond the Normal Period of Gestation with Report of Cases.—Dr. Charles A. L. Reed, Cincinnati, Ohio, read a paper which was based, first upon three cases that

occurred in his practice, as follows: (1) Extrauterine pregnancy with extraperitoneal development of gestation; operated upon fifteen months after conception by marsupialization, and terminating in recovery. (2) Exerauterine pregnancy with retroperitoneal development of gestation, operated upon by marsupialization eleven months after conception and ending in recovery. (3) Extrauterine pregnancy with development of gestation within the anterior abdominal wall, complicated with uterine fibroids, operated upon four years and nine months after conception, ending in recovery. The conclusion reached by the author was that the placenta presents the chief factor in operation upon these cases. In instances in which the fetus is already dead, and in which there are no symptoms of sepsis demanding immediate operation, a delay for a few weeks is desirable, as thereby the vascularity of the placenta will be greatly reduced, if not entirely destroyed. One case indicated that it might persist to an embarrassing degree after six weeks. The operation by marsupialization is recommended, as it avoids hemorrhage, facilitates perfect drainage, and places all conditions under control. The importance of the yeast ferment in eliminating attached fragments of placental detritus was emphasized.

Officers.—The following officers were elected: President, Dr. John Young Brown, St. Louis, Mo.; First Vice-President, Dr. James N. West, New York; Second Vice-President, Dr. Frank F. Simpson, Pittsburg, Pa.; Secretary, Dr. William Warren Potter, Buffalo, N. Y., re-elected; Treasurer Dr. X. O. Werder, Pittsburg, Pa., re-elected; Members of Council Drs. Robert T. Morris, New York, and Howard W. Longyear, Detroit, Mich.

The next place of meeting will be selected by the Council.

AMERICAN CLIMATOLOGICAL ASSOCIATION.

Twenty-second Annual Meeting, held at Detroit, Mich., June 29 and 30, 1905.

Presidential Address.—This was read by Dr. W. F. R. Phillips. It took up the rôle of climate as modifying the animal and vegetable world; the influence on art, architecture, literature, philosophy and religion. The influence of climate on the course of phthisis was considered and the varying attitudes of the profession toward different climates. Definitions of climate were given and show a great want of harmony in what is understood to be embraced. It is a composite, and to study it requires a division into its elements and an investigation of their separate physiologic results. The laboratory must be the means by which climate as a therapeutic agent must advance. Dr. Phillips advocated climatological laboratories at sea-level and on mountains as the best method of solving the perplexing problems in which we are guided so largely by empiricism.

Southern California Health Resorts.—Gen. C. H. Alden, U.S.A., retired, contributed a paper on "Some Southern California Health Resorts, 1904-5." This report is founded on observations during the last eighteen months. The climate of Southern California is equal in its limited range of temperature and in its freedom from severe storms, but there is a sudden and marked fall of temperature at sunset which invalids and others must guard against. There is a great difference between successive seasons in the amount of rainfall and of sunshine, and, consequently, of temperature. The rainfall in 1904-5 was nearly three times what it was in 1903-4, and nearly four times that of 1901-2. The

facts are always suppressed by local boomers who would have the public believe that the region is one of cloudless skies the year round. The climate of Southern California is not a dry one, as some suppose. The humidity lessens as one goes from the coast inland, but the fogs, which in the absence of much rain, are a large factor in sustaining vegetation, penetrate many miles from the sea and add to the humidity. The fact that the humidity is not favorable for pulmonary tuberculosis which is at all advanced is evidently not appreciated as it should be. The interior towns are unpleasantly hot in summer; coolness can be secured only by going to the sea-shore which is too damp for many invalids, or to the mountains where there are scarcely any accommodations suitable for the sick. There is a hostile attitude toward tuberculous patients in hotels and boarding-houses; the best resorts will not admit them and so advertise. They are not now dependent on consumptives as formerly. Patients of this class, if they come to Southern California at all, would do much better if treated in sanatoria. They need daily supervision and cannot be trusted to take care of themselves. They generally make light of their affliction or even conceal it; they indulge in sight-seeing, in amusements and social functions and exhaust their strength. They take up with quacks in many instances. The principal resorts in Southern California were characterized, and data were given as to hygiene and vital statistics. Favorable mention was made of Redlands in winter and the foot-hills of the coast range near Pasadena or Santa Barbara in summer.

The Laurentians.—Dr. A. D. Blackader, of Montreal, read a paper on the "Climatology of the Laurentians." This region is situated north of Montreal and forms a plateau extending from Labrador to Lake Superior. It is made up of very ancient crystalline rocks; it is undulatory, the depressions are covered with detritus or drift, with here and there flats of light sandy soil. The flora and fauna were described and meteorological data given. St. Agathe is one of its best-known districts. It is cold in winter, but not subject to high winds. From December to March the clear days average 14, the partly cloudy 10, the cloudy 10 per month. The winter air is dry, but exact records over a long period are wanting. It was claimed to be an ideal place for all those showing any tendency to circulatory disturbance or throat complications, bronchitis or asthma.

Southern Florida.—Dr. E. L. Shurly, of Detroit, read a paper on "The Climate of Southern Florida for Chronic Cardiac and Vascular Diseases." He laid great stress on the regulation of the action of the skin and intestines in combating renal and cardiac diseases. He prefers the Southern climates to the usual measures such as the use of mineral waters, hydrotherapy or drugs. He excludes from consideration certain cases of valvular disease of the heart of recent origin or incipient aneurisms which appear to be more particularly relieved by a residence at an altitude, but for cases showing more than full compensatory hypertrophy, with more or less condensation or loss of elasticity of the arterial intima or walls, whether accompanied by severe or moderate renal lesion, great relief or a restorative to a condition of ease or usefulness will often follow a residence in subtropical regions. Dr. Shurly mentioned Palm Beach and Key West and Nassau favorably. The diet in these cases should be non-nitrogenous and non-stimulating.

North Augusta, South Carolina, as a Winter Resort.—Dr. Thos. D. Coleman, of Augusta, Ga., read this paper. The advantages of this suburb of Augusta

were detailed. It has an altitude of about 600 feet and is 100 miles from the Atlantic Ocean and 16 miles from Aiken, S. C. It is on sandy hills about 400 feet above the city of Augusta. The accommodations are first class.

Influence of Climate on Gout.—Dr. C. C. Ransom, of New York, contributed a paper on "The Influence of Climate upon Gout." The geographical distribution of gout was considered and it was shown that where malt liquors and wines are largely used gout is much more common than in countries like Scotland, Ireland and Scandinavia, where spirits are more popular. It is very common, according to Dr. Ransom, in America. The Hindoos of India are immune, but it is said to affect the Mohammedans notwithstanding that their religion prohibits the use of alcohol. The effect of climate is subsidiary to other factors in the continuation of the disease. Dr. Ransom does not believe that the atmosphere of the sea-shore has any unfavorable influence on gout, as he repudiates the notion that the humid atmosphere, by retarding elimination and thus favoring the retention of uric acid, will increase gout. Dr. Ransom lays more stress on diet.

Human Blood Pressure and Pulse as Affected by Altitude.—Dr. Charles Fox Gardiner and Dr. Henry W. Hoagland, of Colorado Springs, read this paper. The authors used healthy college students from Colorado College and had the advantages of the new scientific laboratory and the professors of physics and biology. Five miles distant by electric railway was the summit of Pike's Peak, 14,130 feet. A normal pressure for each healthy individual was obtained for 22 college men at 6,000 feet altitude. The average as determined by the Riva Rocci and Janeway instruments during some weeks was 126 mm. Hg. and pulse rate 80. The men were taken by special train to Pike's Peak, 14,130 feet, and on arrival were taken to a room in the hotel. All excitement and excretion was avoided. They were then tested using the same technic as employed in the laboratory at 6,000 feet. Results showed an average pulse of 86 and blood pressure 121, again in pulse rate of 5 and a lessened blood pressure of 5 mm. After remaining three-and-a-half hours at this altitude they were again examined. The pulse rate had risen to 99 and the pressure had fallen to 118 mm. Some exercise, such as walking, had, however, been taken by all the individuals of this group during the interim. A few days after returning from this trip nothing unusual was noted. In other series of experiments it was found that as a rule blood pressure in men and women is slightly lower at 6,000 feet than at sea level after a residence of one year. Prolonged residence at this altitude, in 60 men who had lived twenty-five years at Colorado Springs, the measurements showed at least no excess of pressure. It was found that the more rapid the pulse the lower the blood pressure; when the pulse rate was but little affected by an altitude of 14,000 feet the blood pressure was also more constant; that cases of mountain sickness were accompanied by a fall in blood pressure and a rapid pulse. In any case where the blood tension is low on account of disease a removal to a higher altitude would be likely to aggravate it. It is highly probable that the right side of the heart and venous system play a more important part in the phenomena of altitude effects than we can at present verify.

Dr. Henry Sewall, of Denver, said that although it is laid down in the books that nephritis is influenced unfavorably by high altitude it is not altogether true. Dr. Sewall has had experience with cases of this class that do remarkably well at 5,000 to 6,000 feet on the slopes of the Rocky Mountains. Others do badly. He

quoted the case of a lady with tuberculosis of the lungs and larynx. She held her own in Denver, married and went to Honolulu. There her throat was greatly improved, but her lungs were worse. On her return to Denver her nephritis became aggravated and compelled her return to Honolulu. Dr. Sewall holds that those conditions of the kidneys in which increased venous blood pressure is deleterious are made worse in high altitudes.

Dr. Babcock, of Chicago, said that the difference in blood pressure is so slight, that on that fact alone he hardly saw any explanation of benefit or the reverse that might accrue. We cannot lose sight of the increased depth and vigor of respiration in its effect on patients. So that there are certain problems connected with it that ought to be worked out. Theoretically a case of compensated aortic regurgitation ought to be favorably affected, since any condition which would lessen peripheral resistance as could be done by decreased arterial tension ought to have a favorable effect.

Impalpable Sputum.—Dr. Norman Bridge, of Los Angeles, read a paper on "Impalpable Sputum as a Usually Overlooked Danger in Tuberculosis." He stated that direct infection rather than heredity was responsible for the disease. The infection invades first the lymphatic nodes of the throat, neck, chest or abdomen, where it may remain latent for months or years. Dr. Bridge believes with von Behring that the disease in the lungs is secondary to lymphatic infection and does not agree with him in ascribing the original infection so largely to milk from tuberculous cattle. Dr. Bridge called attention to the tangible sputum which is known and against which war is waged and which is so carefully destroyed; and to the intangible, impalpable sputum ejected by the consumptive in an explosive cough constituting more formidable because neglected and unthought of.

Sputum from Ambulant Cases.—Dr. De Lancey Rochester, of Buffalo, read a paper entitled "The Main Factor in the Spread of Tuberculosis—Sputum from the Ambulant Cases. What are We going to do about it?" He said patients who are unwilling to take the necessary precautions and those who by ignorance cannot be made to conform to instructions against indiscriminate spitting should be removed, by force, if necessary, to a proper institution, and be retained there under proper supervision until death or cure occurs. New York is the only city, as far as the author knows, in the world where this power is held and exercised by the Board of Health. In their experience there is rarely any real difficulty in the management of these cases, if the accommodations which are provided and the food and care given are of a superior character. The law is as follows: "Said Board may remove or cause to be removed to proper place any person sick with any contagious, pestilential or infectious disease; shall have exclusive charge or control of the hospital," etc. According to the General Health Officer, Dr. Hermann Biggs, the death-rate has declined 40 per cent. in twenty-five years. Dr. Rochester said that unless the ignorant and vicious spitters are taken care of in this way, consumption can never be got rid of. If, however, these measures are carried out he firmly believes consumption can be rid of in a generation. As Cornet has said: "The consumptive in himself is almost harmless and only becomes harmful through bad habits." Because of the intangibility of the poison as well as the natural skepticism of lay people and doctors such efforts will be difficult. To say that every hour, day and night the patient must remember to hold a shield in the shape of a cloth or paper before his face when he coughs, and

then destroy the shield, is to impose a large tax on his attention and faithfulness; probably few patients are equal to such a task. With the best of intentions they forget and grow careless. Beards and moustaches should be removed; clothes and bed linen sterilized and sunned, and if sunlight is not to be had they can be hung in a formalin closet. In the latter case the clothes must be aired before they are used again. Carbolic solutions were recommended for floors and furniture. The popular chloride solutions are probably not very useful in this connection.

Dr. E. L. Shurly, of Detroit, Mich., said it might be a very desirable thing to use coercion for the isolation of early or incipient cases of pulmonary consumption, but he doubts whether that could be done in the western States, where the spirit of independence and individual liberty still exists, perhaps stronger than in the State of New York or other eastern States. The question came up in a way, a few years ago, in this State, and Dr. Shurly was unfortunately brought before the bar of the courts here for not reporting a case of pulmonary consumption. The question was pretty well aired by the attorney on both sides, and a great deal of testimony taken as to the communicability of the disease or diseases and the justice of the regulation of the State Board of Health classifying pulmonary tuberculosis with the pestilential diseases, such as diphtheria, variola, cholera, etc. The contention Dr. Shurly's attorneys made at these various times prevailed. Dr. Shurly concedes that such a thing would be desirable in the interests of the family and community as suggested, under certain circumstances, but before such measures are carried out generally, it seems to him that the State should first guarantee to the people honest and competent practitioners of medicine. In most of the States the law regulating medical practice is new, while ignorant faddists are given special privileges. He thinks in New York State the law is older and better than in Michigan, which is only four years old. There are probably not less than two thousand people practising medicine in the State of Michigan who scarcely know the difference between mumps and consumption. Now, under the diagnosis made by these persons a great deal of harm would come from coercive measures advocated. It seems to him the State must first, before adopting coercive measures of that sort, guarantee to the people competent and honest practitioners, and, as the paper suggests, the places to which they are removed must be well provided with good food and other facilities. But to deprive any individual, even a sick individual, of liberty in this country is a very serious step, even though there may be some compensation for it, and in the western States he does not believe such a thing is practicable at the present time. Indeed, the separation of a family in that way cannot be carried out easily.

The statistics of New York may be correct, but he knows the statistics in Michigan are not worth a snap, because the people, under the fear of trouble about their life or benefit insurance, and things of the sort, will hide their complaints, aided frequently by practitioners. For instance, Michigan has a State statute requiring a special burial permit, or certificate of the death of a patient of tuberculosis before removal from the State; now, everybody knows how these death certificates are made out, as pneumonia, whooping-cough, etc., so as to avoid the ordinance. That is done right along. It seems to Dr. Shurly that the medical profession ought to still further improve the laws regulating the practice of medicine, and be able to go to the people with definite data—facts—establishing the general communi-

cability of pulmonary phthisis before radically advocating coercive measures for the isolation of patients.

Dr. Henry Sewall, of Denver, Col., said he was very much disappointed in these discussions. He cannot help but feel that they have represented very little medical progress in the last fifteen years. It seemed to him that looking at this thing from a very practical point of view the curse of our country is illustrated in the enthronement of our notion of individual liberty, which practically amounts to liberty to do harm to your neighbor and not to do good to yourself. The health boards are continually ignored, and it is only through the health boards that we can meet the public. There is no direction in which this society can do more good than to work through the health boards, and to try to see to it that the health boards are constituted as they should be. He thinks the worst enemies of the health boards are the good, honorable well-meaning doctors who call themselves conservatives. They are represented right here in this association, and he believes they have done a lot of harm. A man who does things is bound to make mistakes; but for God's sake, don't stop everything because a man in going ahead is bound to go on the wrong track occasionally. Take an interest in every public health work, and help in that direction. He can see perfectly well how the registration of tuberculosis may be of enormous avail. The law does not yet authorize many things which ought to be done, but Dr. Sewall believes the community is rapidly approaching the point when they will allow the profession more authority—more power. He thinks it is quite a matter of dispute as to whether the germ of tuberculosis may not have to go through some intermediate stage. It certainly does seem to be required to be confined in the dark, and in ill-ventilated spaces. But at the same time there can be no doubt but isolation is a wise thing, to control the sputum that is coughed up by the patient, palpable or impalpable. Our veterinary friends have set a good example in that respect. Good work has been done in Denver with tuberculous cattle simply by adopting intelligent methods of isolation, taking the cattle that were valuable for breeding purposes and allowing them to be used for that purpose; taking the calves and isolating them, putting them out by themselves, not destroying anything except in the advanced cases of the disease; they have thus practically stamped out tuberculosis inside of fifteen years. And Dr. Sewall would be very sorry to admit that what can be done for cattle cannot be done for human beings. As far as the feeling of western independence of the individual is concerned, he has had some little experience on both coasts of this country, and has no hesitation in saying that while there is, in a sense, more individuality in the West, there is also a much higher intelligence and so much better development of what he thinks may be called the common consciousness in western communities that they are more ready to take up with these things, when seen to be necessary, than they are in the East, and that there should be less difficulty in enforcing a rule of this description in an intelligent western community than in the eastern. The death-rate of tuberculosis has decreased in Denver about 35 per cent. in the last twenty years, but the pneumonia death-rate has increased at a little more rapid ratio than the tuberculosis death-rate has declined, and Dr. Sewall does not want to impute any unnecessary ignorance to any-

one, but it is becoming a very unpopular thing to have a death certificate signed as having been due to tuberculosis. Many of these patients are members of small industrial and insurance organizations, and if it had been reported that their death was due to tuberculosis the company would refuse to pay on the ground they had the disease before they were insured. There has been an unconscious influence in that direction, and many of the so-called cases of pneumonia are really tuberculosis. By all means teach the public as far as possible, and isolate all necessary cases.

Dr. Roland G. Curtin, of Philadelphia, Pa., said the subject of the contagion or infection of tuberculosis, if the term is permissible at the present time, is yet a disputable one; there is one class of cases which is in the direct trend of those cases mentioned by Dr. Glasgow. They are the supposed to be cured cases of pulmonary tuberculosis. I think they are the most prolific cause of infection, for the very reason that they are supposed to be entirely well; and they are not so. I had a patient, a young man who had married three wives, and he did not live with either one of them two years; they all died. One in one year, one in a little over a year, and one in a little less than two years. This young man was deaf in one ear, and upon examination I found he had a tuberculous disease of the internal ear, and I suppose he communicated it to his wife through his mouth. I said to this young man, "Are you going to get married again?" and he answered, "The truth is, Doctor, the women are afraid of me, otherwise I would." This case was followed by a man who also had lost three wives, and it was found upon inquiry that he had a cough in early life, and he always had some little cough after that. Upon examination of his sputum bacilli were found, and he probably poisoned his wives in exactly the same way. Since that time I have been particular to inquire about the previous history and examine the lungs carefully of all patients coming to me who have lost two or more wives, and in these cases almost always there is a history of chronic cough, and evidence upon an examination of the lungs of previously existing organic disease. Patients of this class go around spitting anywhere and everywhere during their whole lives, and these are the cases you cannot control by any means suggested. And it seems to me this class of cases is more prolific in spreading the disease and more likely to spread disease than any other class.

Dr. Babcock said that a few weeks ago he saw a Lithuanian priest in Chicago, a very intelligent young man, who had pulmonary tuberculosis. The doctor questioned him with the utmost particularity as to his family history, his previous diseases, and could obtain no clew to the source of his infection. And finally he said to him, "Did you ever live in a room with a consumptive, or did you ever occupy a room in which a person with a chronic case of consumption had lived?" He said, "Yes, Doctor, I lived for two years in a room in which a young man had died of consumption." Dr. Babcock said, "Was he careful with his expectoration?" He said, "No, he spit anywhere he chose." Dr. Babcock said, "Was that room ever thoroughly cleaned after his death?" He said, "No, Doctor; you know that that class of people don't clean their rooms." Now, Dr. Babcock said, one swallow does not prove a summer, and perhaps those who do not believe in direct infection may maintain that that young man

did not get tuberculosis from that room. But Dr. Babcock believes that in the light of the investigations which have been carried on, that that young priest, who was healthy, who had no family taint, who had had no depressing diseases, obtained his infection from living in that room which was infected with tubercle bacilli. Furthermore, the Doctor believes it is shown beyond any question that in families with tuberculosis the disease is communicated as frequently from the children to the parents, as from the parents to the children. In his argument against inherited tuberculosis Cornet gives the tables of cases where the parents are free from tuberculosis at the time of marriage, and free from tuberculosis until after a child had contracted it. And anyone who has read Cornet's work, Dr. Babcock thinks, will bear him out in his conclusion that the disease is communicable and communicated in these instances from the children to the parents. If a single case or group of cases goes to prove anything that the disease is communicable from one patient to another, then I say we are justified in all measures calculated to limit infection. It is only a question of just how far we shall go in order not to antagonize the public too strongly at first. And the Doctor believes that if this question of infection were put to a vote to-day in this Association you would find that the majority, if not all the men, believe it is infectious and it is communicable from one person to another through the medium of something, say the sputum, just as much as smallpox is communicable from one individual to another.

Dr. Norman Bridge said some of the members who have discussed this paper seem to have imagined the possibility that the officers of the law might try to segregate large numbers of invalids in the community; that there is a general belief that in matters of this sort the profession ought to go slow, not to terrify the public, not to scare the people. Dr. Bridge does not know just how Dr. Rochester feels about it, as to whether, if he had his own way he would have a great number of people gathered in by the health officers and segregated, but it seems to him (Dr. Bridge) that here is a truth that should be considered, the value, for the popular understanding of this disease, of having occasionally a man arrested and taught by the courts, as well as by the officers, the force of law. One man's arrest for promiscuous spitting, spitting on the sidewalk, or in the street car, and fining will do more toward educating the public to the dangers of tuberculosis than some of our discussions and a great deal of our literature. If occasionally a known tuberculous patient, a patient known to be a consumptive, were arrested because he is careless in his expectoration and were sent to a hospital or fined, or put under supervision, it would do a vast deal of good. None of us will live long enough to see a great number of patients reached by the heavy hand of the law in that way. But an occasional case of that sort, the Doctor believes, will help mightily toward the intelligent understanding, not only of the force of the law, but of the value of these preventive measures toward the spread of tuberculosis.

"Inspection of the Eastern State Penitentiary of Pennsylvania with Special Reference to Tuberculosis."—Dr. Guy Hinsdale made this report. This prison was built in 1827 and has been famous for the system of solitary confinement. There were 1,070 convicts at the time of the inspection two

years ago, and the death-rate from tuberculosis had been large. Out of 475 deaths from all causes during the previous 25 years, over 60 per cent. had been from pulmonary tuberculosis. There were about forty cases of pulmonary and glandular tuberculosis at the time the visits were made. The pulmonary cases were segregated in the hospital department and afforded more air and liberty than others. The cases of adenitis were not segregated, but put to work outside the cells. The ordinary cell has about 1,100 cubic feet of contents, and has a window in the roof 24 x 24 inches. Ventilation is also permitted through the door into the corridor, which, during later years, has been left ajar six inches and secured by chain and rod. There are doors opening into the little yards attached to the cells, and these doors are opened half an hour daily for men and three hours for women. The plumbing and drainage is most primitive, and is for the most part without traps in the cells. About 20 per cent. of the convicts occupy cells in the upper tier. Through the efforts of the prison physician, Dr. W. W. Leach, and one of the inspectors, Dr. W. D. Robinson, who had invited Dr. Hinsdale to make the report, improved methods were carried out for the treatment of the tuberculous cases, and attempts were made by rigorous disinfection to eradicate the disease from cells which were probably infected. Very satisfactory results were obtained during the past two years, especially in reference to the number of cases originating in the prison. Dr. Hinsdale reviewed the excellent work done at Clinton Prison at Dannemora, N. Y., by Dr. Ransom. It is the practice of the New York State authorities to send tuberculous convicts from other prisons to Dannemora, which is situated on the eastern border of the Adirondack Mountains. The lives of many prisoners have thus been saved.

Dr. John Winters Brannan, of New York, contributed a paper on "The Sea Air Treatment of the Bones and Glands in Children." (See a subsequent issue of the MEDICAL NEWS.)

Permanency of Results.—Dr. F. M. Pottenger, of Los Angeles and Monrovia, Cal., read a paper on The Permanency of Results in Pulmonary Tuberculosis: The After-History of Twenty-seven Cases Treated by the Combined Hygienic-Dietetic-Open-air and Tuberculin Treatment. German insurance companies which maintain sanatoria have issued statistics which show that when treatment is provided for only two or three months and the patients returned to work permanent results were not very satisfactory, as they soon broke down again. A much longer period is required for an economic cure. The report of Dr. Pottenger concerned 27 cases which had been discharged as far back as six years or as recently as twenty-six months. Of these cases twelve were classed as in the first stage, and all were apparently cured or had their disease arrested and remain cured to-day. Of those classed as in the second stage, six were apparently cured or had their disease arrested and remain cured to-day; while of the third stage cases, two had their disease arrested and remain cured. Thus twenty have been cured. Of the seven cases discharged as improved, six are dead. In no instance was there a relapse in any of the twenty discharged as cured.

Hemoptysis in Heart Disease.—Dr. Roland G. Curtin, of Philadelphia, read a paper on "The Significance of Hemoptysis in Heart Disease." It was Dr. Curtin's twenty-first annual paper before the

Association. Bleeding from the lung structure proper i.e., the air vesicles, may be caused by a stasis of the blood, which may be due to the constriction of an orifice in the heart, thus retarding the blood in the lungs; or to a partial cessation of the action of the heart, so as to produce a stoppage of blood in the lungs, thereby causing a congestion and an escape of blood through the lining membrane of the air vesicles. The usual causes are mitral constriction, rupture of degenerated blood-vessels and, less frequently, slowly rupturing aneurysm of the aorta. The diagnosis of the origin of the blood was given. Mistakes in this respect lead sometimes to a diagnosis of lung disease. Examples were given. Dr. Curtin has seen cases of hemoptysis apparently caused by administering nitroglycerin and by the prolonged use of potassium iodide. The blood in all cases should be carefully examined. If the heart disease is acute and the blood is pure the prognosis is bad. If the blood is bright red and quite profuse the prognosis is much more favorable than when dark or purple, showing it to be stale from a slow oozing. If the bleeding is caused by a condition of the blood engrafted upon a previously existing heart disease, the prognosis is not so serious. Death is seldom, if ever, produced by a profuse hemorrhage from this cause alone.

Respiratory Movements of the Bronchial Tubes.—Dr. E. Fletcher Ingals, of Chicago, read this paper. These were first noticed by Dr. Ingals while doing bronchoscopy in a child two years old, and later in a boy thirteen. In a patient, an adult who had had asthma all her life, having had two or three attacks every night for years, the vesicular murmur was not more than one-sixth or one-fourth as loud as normal in either lung, although there were no râles or no signs of emphysema or other disease of the lungs; and the question arose whether the feebleness after vesicular murmur was not due to deficient innervation of the bronchial muscles, and whether the attacks of asthma were not due to irritability resulting in excessive paroxysmal action of the contractile muscles. Dr. Ingals has observed that in inspiration the diameter of the tube was sometimes more than twice as great as in expiration. The investigations of Einthoven, Dixon and Brodie were quoted.

Anthraxosis.—Dr. Henry Sewall, of Denver, reported an "Extraordinary Case of Anthracosis Simulating Thoracic Aneurysm." The patient was an adult, aged forty-six, who had a systolic *bruit* confined to an area represented by the lower half of the right scapula when the shoulders were thrown back. He had worked when twenty years old for a year in the coal regions of Pennsylvania. His breathing became progressively difficult, and there was evidence of a moderate degree of consolidation at the right apex. Radioscopic examination showed a rather dense shadow projecting into the right lung, but its true character was not suspected. Rest in bed and iodides for six months did not improve him. His sputum showed a few tubercle bacilli, and he coughed up some light blood, and had severe pains about the heart. The patient died shortly afterward, and at the autopsy the right ventricle was found dilated and rather hypertrophied. The heart valves were all normal and competent. No sign of aneurysm. At the root of the right lung a hard solid, ovoidal mass, $4 \times 3\frac{1}{4} \times 2\frac{1}{2}$ inches, black and gritty, was found. Analysis showed it to be coal dust.

Immobilization of One-half of the Thorax.—Dr. Charles Denison, of Denver, Col., read this paper. He showed a process of applying bandages for preparing and applying *traction plasters*, to arrest pulmonary hemorrhages, to relieve pleuritis, to contract lung excavations, and to adjust rib fractures.

Election of Officers.—At its business session the Association elected the following officers: President, Dr. E. L. Shurly, of Detroit; vice-presidents, Dr. A. D. Blackader, of Montreal, and Dr. Henry Sewall, of Denver; secretary and treasurer, Dr. Guy Hinsdale, of Hot Springs, Va.; councillor, Dr. W. F. R. Phillips, of Washington, D. C. It was decided to hold the next meeting at Atlantic City in May, 1906.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Stated Meeting, held June 7, 1905.

The President, Arthur V. Meigs, M.D., in the Chair.

Three Cases of Cerebrospinal Meningitis, Probably Due to the Pneumococcus.—Dr. Robert N. Willson, Jr., reported these cases because they demonstrated, in a manner apparently beyond cavil, that the general teaching of the fatality of meningitis caused by the pneumococcus is not always borne out by experience; and, because from the similarity of their clinical pictures, the cases offered a method of discriminating between this and other spinal inflammations. The cases were all treated by lumbar puncture and then expectantly. Case 1 was operated upon twice. In all of the cases there was extremely high tension, and through a rather large canula the fluid spurted out some distance from the spinal column. In every case there was immediate relief to some extent. In Case 2 ptosis disappeared from the eyelids, headache disappeared, and convalescence seemed to date from that point. A week later there was entire return of the symptom complex, and lumbar puncture again had the same effect. In all three cases there was an enormous amount of cerebrospinal fluid. The result of the cases—recovery in all three—was contrasted with the statement found in Osler, that pneumococcus meningitis is fatal, and with Dr. J. C. Wilson's last article, in which it is stated that the pneumococcus form is the most fatal of all forms of spinal meningitis. In all three of the cases it was proved as nearly as possible that the pneumococci were present.

Dr. F. P. Henry thought it extraordinary that the complication is not more prominent in cases of pneumonia, considering that the pneumococcus has been found in cases of pneumonia and traced from the lung to the nasal passages. In cases of pneumonia in children, he has found difficulty in the differential diagnosis of meningitis and pneumonia. He thought Dr. Willson's cases seemed to substantiate his view that pneumococcus meningitis was not so fatal as said to be by the authorities quoted.

Dr. J. Allison Scott called attention to the fact that practically every symptom and sign of meningitis could be found in various affections and yet the meningitis be not present. He thought the diagnosis in the first case reported not altogether secure, because of the bacteriological results, and that the second case was not proved to be one of meningitis, because in almost every case acute leucocytosis is a characteristic of the disease. In

the pneumococcal cases studied recently at the Pennsylvania Hospital, he said that the cerebrospinal fluid was usually somewhat turbid, and that the pneumococcus was demonstrated without difficulty and differentiated from other organisms by culture. He has had two such cases under his care; one fatal in twenty-four hours, and the second within a few weeks. The second case was the result of ear disease without the presence of pneumonia. He was disinclined to a diagnosis of meningitis until the condition is proven by all known means. In a large percentage of cases he believed that the pneumococcus can be demonstrated in the circulating blood, and apparently derived from some other source than the pulmonary tissue.

Dr. Willson, in closing, referred to the statement of one authority, that there is a constant intercommunication between the intraspinal circulation and the blood circulation. He has found the subject interesting in connection with his experiments with reference to the pressure of the fluid. He felt that the most interesting case was that of the boy in which undoubtedly the pneumococci were found. The point in question was whether meningitis was the result of the pneumococci found in the cerebrospinal fluid. In a recent case of dislocation of one of the vertebrae the staphylococci were found. In this case the meningitis was considered to be due to internal traumatism.

A Case of Bacillus Pyocyaneus Septicemia After Surgical Operation.—Dr. John B. Roberts reported a case of infection with the blue pus bacillus occurring in a young colored girl of nine years who had been subjected to a plastic operation upon the arm and shoulder for cicatricial deformity resulting from a burn. The patient did well after the first plastic operation, but, just before a second one was undertaken, had tonsillitis and high temperature. This lasted for a few days and recovery apparently took place. After the second operation she developed symptoms of bronchitis, which was followed by sloughing of the axillary flap, the occurrence of blue pus and severe general symptoms. Investigation showed that blue pus had been observed also during convalescence from the first operation. The patient gradually went down hill with grave secondary anemia, a toxic nephritis which gave rise to blood casts as well as hyaline and granular casts, and finally died. The cause of the grave general symptoms was not recognized, but was supposed to be due to some form of infection of the wound, because typhoid fever, malaria and other ordinary conditions were considered and found to be untenable as diagnoses. Some time after the patient's death, it was found that a number of cases of blue pus had occurred in the hospital, and in one of them bacteriological study showed a pure culture of the *Bacillus pyocyaneus*. The clinical diagnosis of pyocyaneus septicemia was therefore made by Dr. Roberts only after the child's death. A discussion of the symptomatology of the disease and reference to recorded cases concluded the paper. The case was reported, because general septicemia of this origin in the human subject is quite rare, or at least, if more common, is seldom recognized by surgeons.

Dr. J. Allison Scott referred to a case which indicated that not all cases of this infection were necessarily fatal. The case was one of extrauterine pregnancy practically exsanguinated. After transfusion in all parts of the body, especially under-

neath the breasts, she developed a severe infection, which proved to be pyocyaneus in origin. There was great damage to the immediate neighborhood of the salt solution injection, causing necrosis and sloughing. The difficulty, however, was entirely local, and the woman recovered.

BOOK REVIEWS.

LECTURES ON DISEASES OF CHILDREN. By ROBERT HUTCHINSON, M.D., F.R.C.P., Assistant Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond Street. Edward Arnold, London.

Those who have enjoyed the author's previous work on "Food and the Principles of Dietetics," will know what we mean when we say that this work is written in the same highly agreeable style. It is in the form of lectures which were delivered at the London Hospital, and is not quite an exhaustive treatise on childhood maladies. There are but few of us who will not glean from its pages many valuable suggestions. In rather a conversational way the author goes on to speak of colic and vomiting and diarrhea, and many of the so-called "little" complaints, that the ordinary textbook passes by in a most unsatisfactory manner. Then he wanders over the fields of wasting diseases, nervous diseases, blood diseases, etc. One lecture is devoted to some of the common symptoms of children's disease and their significance, and another to certain medical aspects of adenoid vegetations. The pictures are exceptionally illustrative, and particularly striking is the one of splenic anemia in twins. The author finds that adenoids are responsible for a great many of the ills that infants' flesh is heir to: snuffing, epistaxis, laryngeal stridor, wasting from the difficulty in swallowing milk, bronchitis, asthma, dyspepsia, mental dulness, night terrors, nocturnal incontinence of urine, headache, torticollis, etc. The lectures are eminently practical and show the author's intimate knowledge of children and their ills.

THE AMERICAN YEAR-BOOK OF MEDICINE AND SURGERY FOR 1905. A Yearly Digest of Scientific Progress and Authoritative Opinion in all branches of Medicine and Surgery, drawn from journals, monographs, and text-books of the leading American and Foreign authors and investigators. Arranged, with critical editorial comments, by eminent American specialists, under the editorial charge of GEORGE M. GOULD, A.M., M.D. In two volumes. Volume I, including General Medicine; Volume II, General Surgery. Two octavos of about 700 pages each, fully illustrated. W. B. Saunders & Company, Philadelphia and London.

Dr. GOULD's year-book continues to grow in favor from year to year, and there is no doubt at all that the abstracting for it is conducted with a serious conscientiousness that sets it far above the plane of the mere routine glossing of medical literature. The best evidence of this, of course, is the prominent character of the contributors to the volume, among whom are found some of the most progressive of the younger medical men. We miss this year in the volume on Medicine the numerous illustrations that have usually been provided. There are some illustrations, but there might have been more with decided advantage. An excellent feature of this work is the very complete index which accompanies it. This is doubtless due to the experienced editors.